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THE WIDTH OF LODE CLAIMS.

It is in Colorado that the United States mining law is undergoing just now the severest test, in the settlement of new and troublesome questions of title. That the phraseology of the law is far from clear, has been often demonstrated. Cases continually arise which do not seem to have been provided for by the framers of the statute; and a process of interpretation and application by the courts—a "construction" of the law sometimes amounting to a reconstruction—is now going on. Whether it will end in a body of judicial decisions, constituting a harmonious and practicable code, or in a confusion of contradictions constituting a *reductio ad absurdum*, and necessitating a new start in legislation, remains to be seen. In the mean time, we are disposed to criticise with lenity, though with frankness, those interpretations from the bench which attempt to apply such principles as are already established to the complicated problems arising under the Federal and local laws. It has fallen to the lot of Judge HALLETT, of the United States Court in Colorado, to pronounce within a few months past several important decisions of this kind. One of the latest of these, delivered February 5th, in the case of GEO. W. HALL *et al. vs.* the Equator Mining and Smelting Co.—commonly known as the Colorado Central and Equator case, from the names of the two locations involved—deals with a point not heretofore raised, so far as we recollect, but one which we have long regarded as likely to arise and to make trouble. We shall briefly state the essential features of the case, referring our readers for further information to a part of the decision, reprinted in another column.

The Central and Equator locations are 1400 and 1500 feet long respectively, and 50 feet wide. They run nearly east and west, differing about 12 degrees in course, and crossing each other at that angle "as the rails of a Virginia fence overlap each other" (to use Judge HALLETT'S happy comparison), two or three hundred feet from the east end of the Central and the west end of the Equator. The Central has the older patent, the Equator the older location.

"The position of the claims," says Judge HALLETT, "seems to indicate that they are cross and intersecting lodes passing each other with an acute angle of twelve degrees, * * * and with that assumption the locations stand * * * with the right in each party to pursue his lode throughout its course, except at the space of intersection, which would belong to the first locator." As the evidence was held to show a different state of facts, this principle was not applied in the case. Otherwise, it might be vital to inquire whether, in such a case, the first *locator* or the first *patentee* would be entitled to the space of intersection. It has been held that the silence of an earlier locator, when a subsequent locator applies for patent, is a waiver of his priority. Whether such a waiver includes every possible consequence of priority, and puts the proprietor of the uncontested patent upon the same footing as if no prior location had existed, is a doubtful point. If that were the case, the practice of the Land Office would work considerable hardship; for the office has, if we mistake not, repeatedly ruled, that claimants upon cross-lodes have no grounds upon which to oppose the issue of patent to later locators upon the lodes crossed; since their rights to the space of intersection are unaffected by the issue of the patent. But, on the other hand, the statute is equally explicit in saying that, "Where two or more veins unite, the oldest or prior location shall take the vein below the point of union." Yet we scarcely think that, under this provision, the courts would take away from a patentee the rights he had obtained by purchase from the government.

For instance, A has a location covering a certain outcrop, for which he neglects to take out a patent. B has a later location upon a parallel outcrop, there being indubitably country-rock between the two. B obtains a patent, A making no objection. Subsequent workings show that the two veins unite in depth, and become one. Does that one belong to the patented or to the unpatented location? Recognizing the difficulties and hardships of the case, we are nevertheless forced to conclude that the patentee should have preference. Holders of possessory titles only, if they choose to abstain from application for patent, must take the risk involved. While their titles remain in this precarious condition, they must be vigilant to foresee all possible interferences, and not allow patents to pass without protest which may affect their claims. But a patent, once obtained, without fraud and without opposition, should be an absolute conveyance and an absolute protection from the government.

If this be the correct construction of the law (as the decision in 4 Saw., 302, seems to indicate), it will cover also the question of the space of intersection of cross-lodes. The government owns the public lands and the minerals in them. It chooses to permit their free occupancy, exploration, and exploitation on certain conditions, saying, however, to its citizens, "I will sell outright to any of you who have good possessory titles, and give you absolute titles. In every such case of proposed sale, I will give to all whose possessory titles may be affected thereby an opportunity to protest. If no protest is made, all such claims will be held to have been waived; and nothing shall affect the rights of the purchaser under the patent which I give him, except the reservations made therein and the rights I may have granted to others by previous sales and patents."

The true remedy for owners of possessory claims, when patents are applied for by their neighbors, which may affect their privileges, is to protest, and either to make application for patents on their own prior locations, or cause an explicit reservation of their claims to be inserted in the patents granted to their rivals. One thing is certain: the courts will continue to attach great weight to the definite and absolute grant contained in a patent. The tendency is to the steady increase of this consideration; and possessory owners, as well as intending purchasers of mines, should act accordingly.

But in the case before us, Judge HALLETT rules that this point is not involved. The ground in dispute, he says, contains but one lode, the foot-wall of which is seen in the Equator workings, bearing a vein or sheet of ore, while the north or hanging wall has not been certainly discovered. The Central location, north and east from the Equator, is, he says, situated somewhere on the interior of the outcrop or top of the lode, covering a part of the lode between the walls, but not touching on either of them. In that location also there is a vein of ore, less distinct perhaps than the other, but distinguishable from the general mass of crevice material. The attempt to prove that these two ore-veins meet on the foot-wall within the disputed ground is held to have failed.

The narrowness (50 feet) of these locations is the result of local law, which is binding on the parties so far as it is consistent with the Revised Statutes. The two claims being admitted to lie on the same lode, but neither surveyed location being wide enough to cover the whole, Judge HALLETT decides that separate and parallel portions of a lode may be the subjects of separate patents; and that the vein on the foot-wall is in this case so far distant from the general mass of the lode that it could be taken and located without including the entire lode in such location. For his argument on this important point, we refer the reader to the published extract. Assuming the facts as he states them, and accepting particularly his positive declaration that the material between the two "veins" of ore which he describes as included in one "lode" is vein-matter or gangue,

and not country-rock, we have to make the following criticisms upon his views of the law.

1. The subject of the grant contained in a United States mining patent is not a vein of ore, but a vein of quartz or other rock in place carrying ore. Hence, if the Court is satisfied that a mass of rock intervening between two seams of ore is vein-matter, the two seams must be held to be parts of the same vein or lode. It is quite true that small veins of ore occur within lodes; but it is not true that the terms vein and lode in the statute have reference to such a distinction. On the contrary, as has been repeatedly held, the words are used in the Acts of Congress as interchangeable and synonymous. The phrase is "a vein or lode," not "a vein or a lode."

2. The width of the surface location is left to local laws, "so far as the same are applicable and not inconsistent with" the United States law. This provides that the surface location shall not exceed 1500 feet in length, or extend more than 300 feet or less (except in certain cases) than 25 feet on each side of the middle of the vein at the surface. But the law provides also that the locator shall have full right, between the end-planes of his location, to the vein on which it is based. If the local law operates to limit that right, it is in so far void, both for "inapplicability" and for "inconsistency."

3. The surface was by the law of 1866, perhaps, not actually granted in full ownership. At least, that was the view held by the Land Office, though we doubt whether it would have been confirmed by the Supreme Court. Later legislation has made it improbable that the question will ever arise for authoritative settlement. The Revised Statutes now give to the locator the exclusive title to his surface. The boundaries of that surface-claim are all-important to determine several things, to wit: The end-lines, projected as vertical planes, absolutely bound the locator's rights on the course of all veins; while all the lines, similarly projected, inclose a space within which, if he finds the tops or outcrops of other veins than the one specified in his patent, he may follow such veins on the dip into the land adjoining.

4. Do the side-lines of the survey affect the right of the locator to follow and work a vein, outcropping within those lines to the extent of a part, but not the whole, of its width? Such vein may be either the vein specified in the patent, or one subsequently discovered. In the former case, it is presumed by the Land Office, in issuing the patent, that it covers the outcrop of the lode; and the patent consequently gives the right to that lode, and all others cropping or topping within the surveyed and granted ground. But the top or apex of a vein need not be the whole of the vein, from wall to wall; and the demand that both walls of a vein shall be discovered, before it can be claimed and followed, is a very exacting one. In many instances, it could not be complied with at all. The simple rule should be to construe a partial outcrop within the lines as satisfying the law. If an adjoining parallel location contains the rest of the outcrop, the question is simply one of priority of title. The elder location, or, if there be a patent, the elder patent, takes the vein which crops out *within two locations.*

5. Let us see how Judge HALLETT's views would operate. A locates 25 feet in width on each side of the middle line of an outcrop discovered by him, only 50 feet wide; but this 50 feet is the upper edge of a vein which, immediately below, becomes 100 feet wide, so that 25 feet of its thickness extends into the parallel later location of B on one side, and 25 feet into the similar location of C on the other. A can, in this case, claim and work the full width of the vein which he has discovered, and follow it to any depth. But if he had discovered the same vein, at a point where it was 60 feet wide on the surface, he could not have got any right to follow it in depth at all. For the local law would confine him to a surface claim extending only 25 feet each way from the middle line; and hence, 5 feet along each wall of the vein would be left to adjoining claims. The law would not permit him to locate those adjoining claims for himself; and if he could do so, it would help him little; for, as the vein discovered does not crop out *wholly* within any one of the claims, each locator, according to Judge HALLETT, "will own all within his lines, without being able to go beyond them." The union of the three claims under one ownership could confer rights which neither of them possessed. Hence, if A, B, and C should sell out to D, D would own the whole outcrop of the lode, and yet have no right to follow it in depth! In short, under this decision, there would be no possible way, under a local law prescribing the width of location above supposed, of obtaining from the United States the mining rights which are contemplated by the Federal laws.

Or, again, A discovers the foot-wall of a lode, with a seam of ore lying upon it. Very likely there is a similar seam along the hanging-wall, that being a common exhibition of symmetry in the structure of true fissure-veins. He does not know where the middle of the vein is; and he is forced to record his location within a brief period, on pain of losing his title altogether. Necessarily, he locates his claim to include the foot-wall; and, supposing that his fifty feet in width only limit him as to surface ownership, and as to claims on possible veins yet undiscovered, he rests in the belief that he has secured a certain length on the principal vein. But on cross-cutting and developing, he finds the hanging-wall to be outside of his surface lines, and is told by Judge HALLETT that until the hanging-wall seam of ore comes into the foot-wall seam (which it will not do, as a general rule, unless the lode pinches), he can not lay claim to it! We might multiply instances to show that this application of local laws regarding the surface lines, or any application of the surface lines which permits parallel conflicting ownerships on one vein or lode, and at the same time deprives them, one and all, of the right to follow the lode in depth, unless they can maintain the independence of some particular seam within it, is fatal to security of title.

6. The case of the Comstock lode, cited in passing by Judge HALLETT, proves just the opposite of what he intends. For it is not true, as he supposes, that, in the Comstock, the "vein" is on one side of the "lode." On the contrary, the history of mining on that lode has repeatedly involved the discovery of new ore-bodies to the east or hanging-wall side, and beyond what had been supposed to be true hanging-wall. If his doctrine were accepted, almost every mining company on the Comstock would have been deprived, at one time or another, of its valuable bodies of ore; and the era of chaos and conflict, arising out of innumerable surface locations upon seams, strings, leaders, and what not, would have been perpetuated until now.

7. The two fundamental mistakes which have led to this decision appear to us to be the mistake of supposing that a narrow surface location can defeat the purpose of the Federal law as to the full mining right on a discovered lode; and the mistake of saying that, in such a case, though the whole lode may not be held, yet a subordinate seam of mineral in it may be held. Thus, the discoverer of a very wide and valuable lode, impregnated throughout with precious metal, could get no right to follow it in depth; if he could find a thread of ore different from the rest, he might call that a vein, and follow that; but if that should give out, and he should have, say at 50 feet depth, only his homogeneous, impregnated vein, which was too big for his surface lines, he could not follow that into adjoining ground, and would lose his mine. In other words, the larger and more uniformly valuable is the vein he has discovered, the smaller and more precarious is his title to it!

There are other stand-points and consequences which call for consideration. But we must be content with what we have said. Judge HALLETT seems to admit that the law, as he construes it, is practically unjust, but he says "it is none the less controlling." He apparently thinks his decision was an unfortunate necessity. We agree with him that it was unfortunate, but not that it was necessary.

PERSONALS.

Our Readers are invited to send us Items for this Column.

More than 100,000 tons of Algerian and Spanish iron ore will be imported into the United States this year. This ore is now going as far West as Harrisburg, Pa., and will probably reach Johnstown, Pa., in competition with Lake Superior.

Such warm appreciation of the course the ENGINEERING AND MINING JOURNAL has pursued, as is indicated in the following letter, is always gratifying and encouraging, and it is doubly so when it comes from so high an authority as Professor COMSTOCK, of Cornell University:

"Allow me to express my hearty congratulations upon your success in the firm stand you have taken on the subject of legitimate mining. I have reason to know that you have done much good for the profession as well as the business, and I offer you my thanks. The improvements in the JOURNAL are most excellent and gratifying."

We have received the prospectus of the Tower Mountain Mining Company, of San Juan, Colo., and are asked, as we so frequently are, to express an opinion on the value of the property, for the benefit of proposing investors. Our answer will apply to many other mining companies besides the one mentioned. The prospectus makes certain wild statements of rich assays and probable profits. The statements are unsupported by any expert testimony, and give no data upon which it is possible to decide whether the company actually owns any property, or, if it does, whether the property is of any value whatever. In the absence of competent expert reports upon the property, and detailed information, no sane man would invest a dollar in the stock. As it is presented, aside from the character of the officers of the company, of whom we know nothing, the enterprise is not worthy of attention. Perhaps some of our San Juan readers will favor us with some information concerning the property and its promoters. The company is organized in Titusville, Pa., and Mr. J. U. ANGIER, of Ouray, Colo., and S. G. STEVES, superintendent, of Howardsville, Colo., represent the company in Colorado.

AUSTRALIAN EXHIBITION.—Mr. Williams, United States Consul at Sydney, Australia, informs the Department of State that the scope and plan of the International Exhibition to be held there has been greatly enlarged. The opening has been postponed to the first week in September, 1879. The United States has been allowed 40,000 square feet of space. Mr. Augustus Morris, who was Executive Commissioner for Australia at Philadelphia, is secretary of the commission at Sydney.

UTAH MINERAL WAX.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: At the suggestion of my father, Prof. J. S. Newberry, I have made a further examination of the Utah mineral wax, which has been the subject of some recent discussion in your journal. Prof. Wurtz first termed this *zietrisikite*—later, a lower member of the zietrisikite series; while Dr. Newberry considered it *ozocerite*. The investigation was undertaken in the hope of solving this problem.

The crude minerals ozocerite and zietrisikite are undoubtedly mixtures of hydrocarbons, belonging perhaps to different chemical groups. I can find no authority for placing these two minerals in different series. Dana (*Mineralogy*, p. 731) states that the constituents of the various natural paraffines have a nearly uniform interval between their points of fusion, forming a series of which the following are the representatives:

	Melting-point.
Urpethite (Laurent)	33° C.
Hatchettite (Johnston)	46° "
Ozocerite (Hofstädter)	60° "
Third fraction of Johnston's Urpeth Colliery Mineral	73° "
Zietrisikite (Malaguti)	90° "

If Prof. Wurtz accepts this classification, he can scarcely be justified in ascribing the name zietrisikite to any portion of the Utah mineral; for he finds the melting-point of the crude substance to be 66°, and obtains fractions melting at 42°, 67°, and 71°. But the most striking inconsistency in his reasoning is, that in his article he continually compares the melting-point of the crude Utah mineral with those of *fractions* of the foreign ozocerites and zietrisikites, and *vice versâ*. He says: "The figure assigned to the former (zietrisikite) series by Dr. Newberry, I am unable to verify by my examinations of the literature of the subject. Malaguti obtained *fractions* having a fusing-point as high as 90°; but his crude zietrisikite fused at 84°, and yielded to boiling alcohol fractions fusing at 75° and 78°." This statement certainly accords with the authorities; but it is important to remember that it was to this *fraction* having a melting-point of 90° that the name *zietrisikite* was given by Dana. The only just comparison that can be made is between corresponding fractions; and thus we find that Prof. Wurtz's fraction of the Utah mineral having the highest point of fusion melts at a point more than five degrees below that of the most fusible fraction of the crude substance described by Malaguti. In the face of these facts, the resemblance between the two minerals is by no means clear.

My own experiments give results so widely different from those of Prof. Wurtz that I have little doubt that, as he suggests, we are working on different material. The specimen I have examined was brought from Utah in January by Prof. Newberry himself, and doubtless fairly represents a portion, at least, of the deposit; but, since the mineral occurs over a considerable territory, it was to be expected that specimens from different localities would present somewhat different features. I have obtained the following results:

Fusing-Point of the Mass.—The method recommended by Prof. Wurtz—coating thermometer-bulbs with the material and immersing in water—gives 61·5° for the fusing-point of the crude material. The fusing-point of Glocker's Slanik ozocerite (Dana's *Mineralogy*, p. 732) was 62°; that of Hofstädter's Galician ozocerite (same reference) was 60°. Prof. Wurtz objects to the figure 60° as being too high for ozocerite, and suggests that, if divested of fractions insoluble in ether, it would give a lower result. Here again he fails to make a just comparison; for his specimen of the Utah mineral also had a lower fusing-point, when freed from substances insoluble in ether, than the crude material. I have examined three specimens of Galician ozocerite from the School of Mines collection, and find their fusing-point to be 63°, 69°, and 72°, respectively. It is evident that the point of fusion of these crude substances is not a reliable basis for their identification; for they are all mixtures of hydrocarbons of different degrees of fusibility.

Solution in Ether.—1·5 grams of the Utah mineral were treated with about 300 c.c. of cold ether, and allowed to stand for 24 hours. The solution was decanted through a filter, evaporated, and the resulting substance tested by the above method to obtain the fusing-point. This treatment gave a fraction equal to 25·4 per cent of the original substance, and having a fusing-point of 49° C. The residue was again treated with 200 c.c. of cold ether for about the same time, and gave a further product equal to 9·1 per cent of the original mass, fusing at 61°. Upon boiling the undissolved portion in about 500 c.c. of ether, the whole mass went into solution, and upon evaporation was found to have a fusing-point of 67°. Comparing these results with Dana's table given above, we may infer that the first treatment with cold ether dissolved out the whole of the second member of the series, which fuses at 46°, together with a small quantity of the next higher member; that the fraction obtained by the second treatment consisted almost entirely of the third member, ozocerite, which is sparingly soluble in cold ether; and that the residue, which dissolved completely in boiling, was a mixture of ozocerite with the fourth member of the series. If any zietrisikite had been present, it would have remained undissolved; for, according to Dana (*Mineralogy*, p. 733), the almost complete insolubility of zietrisikite in ether distinguishes it decisively from ozocerite. Prof. Wurtz probably has some reasons which he has not stated in his article for calling the mineral from Utah "a lower member of the zietrisikite series;" for his results, as well as my own, do not indicate a greater difference in properties between the Utah material and the crude ozocerites of Europe than the latter exhibit among themselves, and I am unable to find in the literature of the subject any mention of a "zietrisikite series," or of any other zietrisikite than that to which Dana ascribes the fusing-point of 90°.

Boiling-Point.—As none of the Centigrade thermometers in this institution are graduated to a point above 380°, it was impossible to ascertain the boiling-point of the material; for up to the highest point to which it was safe to allow the mercury to rise, no evidence of boiling was visible. The boiling-point is certainly above 300°, probably above 380°. The phenomenon of the sudden *leaping* of the mercury column, noticed by Prof. Wurtz in examining the Utah mineral, I find also manifested in the Galician ozocerite. The thermometer rises gradually in each case to about 300°, then suddenly jumps to the top of the tube. On cooling, it falls almost as suddenly to 270°.

The statement is made by Prof. Wurtz that he has complete evidence that these mineral hydrocarbons are entirely distinct from true *paraffines*, and he promises to discuss the question further in another paper. Evidence which would solve this very difficult problem would be of great value. Schorlemmer, in the *Chemistry of the Carbon Compounds*, p. 75, under the head of *The Paraffine Group*, says: "Solid paraffines occur in nature, forming the minerals known as fossil wax, ozocerite, etc." It is very difficult, however, to make an ultimate analysis of a hydrocarbon of complex molecular formula with sufficient accuracy to determine whether its place is in the *paraffine* group, represented by the general formula, C_nH_{2n+2}, or in the group of *olefines*, C_nH_{2n}. According to Dana, the natural paraffines contain probably not less than 28 atoms of carbon to the molecule. The percentage composition of a paraffine containing this number of carbon atoms would be: Carbon, 85·29; hydrogen, 14·71; while that of the corresponding member of the olefine group would be: Carbon, 85·71; hydrogen, 14·29. Considering the difficulty of making a perfect separation of the different chemical compounds which constitute these minerals, this difference in composition is so slight that a solution of the problem by ultimate analysis is next to impossible. My analysis of the Utah mineral gives: Carbon, 86·15; hydrogen, 13·75 = 99·90. These figures show proportionally more carbon than is recorded in the analyses of ozocerite and zietrisikite; but the latter results are so varied, as given by different authorities, that analysis is of no assistance in identifying the mineral.

The action of oxidizing agents is an important method of distinguishing the paraffines from other groups, as the former are entirely unaffected by cold sulphuric and nitric acids. I have not as yet investigated this branch of the subject thoroughly, but hope to have some results to present in a future communication.

Yours, respectfully, SPENCER B. NEWBERRY, E.M.

SCHOOL OF MINES, COLUMBIA COLLEGE, March 12, 1879.

THE DISCOVERER OF THE MICROPHONE.

EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: In your issue of March 15th (p. 183) you call upon me to give up my claim as to being the inventor of the microphone, basing your opinion upon some testimony which has been published in the *Telegraphic Journal*, of London, on Clérac's tubes. The fact that Clérac or any other person discovered the variability in the resistance of carbon to pressure before I did has no connection whatever with the microphone controversy. I claim, and no one has denied it, that I was the first person to take advantage of this property and apply it to acoustics, that is to say, the first to use it for translating sound-waves into electric waves. Again, I do not admit that Clérac discovered this property of carbon, because his tubes will not do at the present time what he claims they did many years ago, and a million affidavits will not alter an experimental fact. The whole thing is an afterthought on the part of Hughes to justify his proceedings. Tubes of carbon have been used for years, even in this country; but advantage was not taken of the decrease of resistance by pressure to produce variations. You will also notice in a later number of the *Telegraphic Journal* that the controversy is not by any means ended, as Professors Zetzsche and Barrett again come forward, the former alleging some of the statements of Hughes to be false.

Very truly, THOMAS A. EDISON.

MENLO PARK, N. J., March 17, 1879.

THE BULLION CLUB.

The Bullion Club, of this city, last winter elected Right Hon. William E. Gladstone, late Premier of England, a corresponding member of that association, and instructed the Secretary to inform the distinguished gentleman of the fact, and ask his acceptance of the membership. In reply to the letter of the Secretary, Mr. Gladstone writes as follows:

"DEAR SIR: I am in receipt of your letter and inclosure of February 15th, and I thank the club for the honor they have conferred upon me.

"I can not doubt that they will render much service by collecting information, and I hope also by discussion. Their title will be liked on this side of the water. I must not, however, presume to offer an opinion on your matters, beyond stating my adhesion to these propositions—that state debts ought to be paid in a medium of not less value than that in which they were contracted; that gold is the best standard; and that a double standard is not, in strictness, any standard at all.

"Your faithful servant, W. E. GLADSTONE.

"March 3, 1879."

The Secretary of the Club is also in receipt of a letter from Don Manuel de Zamacona, the Mexican Minister, conveying the promise of the government of that country to furnish the club with all official documents relating to the mining interests of the country, and also a letter from Gen. Macano Prado, President of the Republic of Peru, accepting his election as corresponding member of the society, and stating that he had ordered all the official documents relating to the mineral resources of Peru to be prepared and forwarded to the club.

A NEW MODE OF PLANTING TELEGRAPH POLES.—The following method has recently, says the *American Manufacturer*, been tried with success in Titusville, Pa. The ground being staked off at distances of about 200 ft. apart, a man starts off with a pocketful of four-ounce cartridges containing a wonderful new explosive known as "electric powder," and with a crowbar in his hand. A hole is punched from 4 ft. to 5 ft. with the bar in a few minutes, and a cartridge dropped to the bottom with a fuse lighted with a match. The operator then walks to the next stake, before reaching which a low, dull thud is heard behind, a hole about the diameter of a flour-barrel has been blown in the ground to the depth of 4 ft. or 5 ft., and the work is followed up by a gang of men who plant the poles in the holes thus made, fill in with gravel and earth, and the job is complete. It matters not what soil is perforated with the bar, wet or dry, loam, clay, gravel, slate or boulders—provided the bar can be inserted—the effect is the same. A gang of four men, with poles delivered on the ground—one man to blast and three to erect the poles and tamp them—will put up from 100 to 150 poles a day of ten hours each. The cost, therefore, of this new and improved process is about two thirds less than the ordinary method of planting telegraph poles, as now practiced.

RESPONSIBILITY IN MINING ENTERPRISES.

By Professor Theo. B. Comstock.

For the unflinching manner in which the ENGINEERING AND MINING JOURNAL has pursued its straightforward, honorable purpose of furnishing reliable information in regard to mines and mining schemes, it is deserving of hearty congratulation, not only from the profession itself, but from every honest individual who has a dollar to invest in legitimate industry. This course of action is especially gratifying to those whose reputations are placed most in jeopardy (too often quite unjustly) by the failure of enterprises which are themselves but little dependent for success upon the truth or falsity of the expert reports. Mismanagement on the part of incompetent or dishonest officials has heretofore produced more disastrous results than the unwise investment of capital in inferior mines. Little sympathy can be justly extended to those who will expend their money in projects based upon assays of ores sent in minute quantities through the mails, often, as the writer can testify, accompanied by a note to the effect that "this is rather under than over the average, and was taken from a depth of only two feet below the surface." Assay certificates are too commonly regarded as sufficient evidence of the real value of lodes which may never have been heard of by the assayer, who, with all his skill and reputation for accuracy in furnace work in the laboratory, might be wholly incompetent even to select himself a fair sample for his tests. It may not be known to every body that perhaps nine tenths of the specimens received by assayers from a distance have such an appearance as would indicate almost entire absence of gangue in the lodes, if taken as fair samples of the ore to be worked. Even "mill-runs" of several tons of ore from a small shaft or "prospect-hole" may be very honestly made to yield at least twice the proper proportion of metal by "averaging" processes which would seem wholly satisfactory to persons but partly conversant with these matters. Unscrupulous assayers know how to enlarge their business by furnishing reports of rich yields from carefully prepared specimens, while mine-owners often feel it unnecessary to produce certificates of such grades of ore as *they* believe to exist in comparatively small proportion in their particular property. With the very best intentions, those who wish to dispose of properties or to secure working capital are ready to state that the "amount of high-grade ore in sight is enormous," or that "competent experts have pronounced this mine one of the most wonderful discoveries ever made in this exceedingly rich mineral belt." These and numerous similar statements are highly proper, and much to be desired, *provided only* that facts and authorities are invariably given. With a very few notable exceptions, the actual report of some competent authority is almost the only means of information accessible to the general public, as regards mines in what may be called their *prehistoric* condition. This, instead of being the last consideration, should always be the first item of expense in all negotiable mining claims. Excellent mines have been opened and very successfully developed by companies whose officers have blundered into prosperity by virtue of their own integrity and by chance. But such cases are not more common than the achievement of honest fame without labor in other undertakings.

Those who make it their profession to examine and report upon the value of mineral claims are too frequently importuned to make bargains which, in any other calling, would be regarded as mere speculations, and which would leave the expert dependent even for his expenses upon the results of his report. The writer has been asked to go from twenty to three thousand miles to examine such properties, and to take his entire remuneration in small interests in mines entirely unknown beforehand, and that, too, conditioned upon the disposal by himself of large blocks of the company's stock.

Responsibility in mining enterprises should be made to rest more heavily than it now does upon the shoulders of mine managers and company officials. This can only be accomplished successfully in all cases by systems of supervision and constant inspection, similar in character to the foreign mining bureaus, subject to governmental control. There seems no good reason why the interests of small investors should suffer, as they often do in this country, in almost inverse proportion to the amount at risk. There are no safeguards vouchsafed to unofficial stockholders, whereby the certainty of prompt and reliable information is at all times assured. Some cases might be cited of praiseworthy efforts and well-designed plans to furnish security of this kind. Auditing committees, if sufficiently large and elected by the stockholders themselves, without regard to the number of shares held—and especially if chosen upon the plan of overlapping terms, as in the case of members of the House of Representatives—are very important checks upon the management; but one thing is needful, which is invariably overlooked in such elections—it is imperative that these committees be chosen by the casting of a single vote by each stockholder, regardless of his proportion of shares. Otherwise, the present system of appointment by the president is much better than a general election, as the responsibility can be more readily placed when the committee becomes manifestly the tool of the managers. A properly-constituted committee, with power to arrange its own system of vouchers for the use of the officers, might do very much indeed to check peculation and speculation on the part of directors so inclined.

Investors in mining companies should learn to put their trust in facts and men, rather than in hopes and stocks. Much capital is wasted every year in investments based almost wholly upon the relation of cost to par value of stocks, with little or no regard to the value of properties or the character of officials. This has, perhaps, been the main cause of the reduction in par values which has occurred of late years, though other really important reasons have been concerned in producing this effect. It is a remarkable fact that the best mines in this country as regards management and fair treatment of stockholders are to-day selling in the market at much lower rates than many wild-cat schemes with not even a prospectus worthy of consideration, while the stocks of other companies on the list of the New York Mining Exchange have never reached a price as low as the highest value claimed for the property.

If we were asked to tabulate a series of hints to be used as guides in mining enterprises, the following would certainly occur among the most important:

I.—TO THE PROMOTOR OF MINING SCHEMES.

1. First satisfy yourself that the property is one in which you would be willing to invest a small sum of money, *not* enough to give you a controlling interest.

2. Obtain an unbiased expert opinion from some one whose reputation for honesty and ability is beyond suspicion.

3. Instruct your expert not to make any estimates based upon suppositions, but let him ascertain definitely the actual value and future prospects of the mines. Procure reliable evidence of the present cost of labor, supplies, transportation, reduction of ores, market facilities, and of every item which can affect the future development of the property.

4. Lay all this information before those whom you desire to interest in the enterprise, and trust to their good sense for the result.

5. Having secured the attention of trustworthy men, form your company upon the most liberal basis, making all possible provision for the interests of the smallest shareholders, with abundant checks upon the freedom of the officials, to which none but dishonest men can object.

6. Avoid the mistake of insufficient capitalization to meet the prospective demands for working facilities, but be still more careful not to provide capital largely in excess of these requirements.

7. Place the stock upon the market only after the mine has made a history for itself which will require no manipulation to make it active.

(TO BE CONTINUED.)

THE COAL AND IRON OF THE HOCKING VALLEY, OHIO.*

By T. Sterry Hunt.

It is now five years since I called the attention of the Institute to the industrial importance of the coal and iron ores of the Hocking Valley, in Southeastern Ohio, and in a pamphlet on the region, published soon after, in 1874, endeavored to resume the principal facts then known respecting it, including the observations of the Geological Survey of Ohio made and published up to that time by Profs. Andrews and Wormley; together with an estimate of the probable future of the region, and its relations to the coal and iron markets of the country. Since that time, the labors of the Geological Survey have included a further study of the coal by Prof. Edward Orton, the results of which, yet unpublished, will be awaited with much interest. I may say, from my knowledge of them, that, while confirming the general conclusions of his predecessors, he has been enabled to add much to our knowledge as regards the correlation of the various members in different parts of the coal-field, and to show more clearly the positions and the importance of the ore-beds in the Hocking Valley region. The only ore mined in that vicinity previous to 1874 was below what is called the Great Vein, or No. VI. coal, and was to the west of what was known as the Hocking Valley coal-field; and although experiments in a few furnaces in the State had shown that this coal could be used with advantage in iron-smelting, there was not a single blast-furnace within the field. My observations at that time, however, impressed me with the abundance of iron ore, not only below but above this important coal seam, and I then ventured to express the opinion that this region, from its cheap and easily mined smelting-coal, its native ores and limestones, and its geographical position and relations to the great markets of the West, and to the supply of rich iron ores from Lake Superior, was destined at no distant time to become a great metallurgical center, where iron could be made more cheaply than at any other equally accessible point in the country.

The object of the present communication is to report progress, and to state how far my observations made in the region last month have justified the predictions of 1874. The five years which have elapsed have been, as all know, most unfavorable to the iron trade, and especially to new enterprises in untried regions; yet they have not passed without important industrial developments in the Hocking Valley, where no less than thirteen blast-furnaces have been erected within the past three years, the whole within a radius of about ten miles, and not far from Shawnee, Straitsville, and Bessemer. One of these is not yet completed, one is enlarging, and three from financial difficulties are inactive. The others are in successful operation, and it is probable that in a few months the whole number will be in blast. Of these furnaces, the greater number use native ores alone, in some cases the Iron Point or Black Band, which, after calcination, gives fifty per cent of iron; while three are smelting with admixtures of native ores, yielding from thirty to forty per cent of iron, about one fifth of Lake Superior ore. The success of those who have been able to carry on their smelting operations has been, for the most part, highly satisfactory, and the iron produced is of excellent quality, especially for foundry purposes, and finds a ready sale in the markets of Ohio and Michigan. The production, which amounted to about 24,000 tons in 1877, exceeded 70,000 tons in 1878, and the present improved tone of the iron market will probably lead to a considerable increase in 1879. This record, it may be fairly claimed, shows a remarkable progress in a new region, effected during a period of unexampled depression, and is of good augury for the future.

I should violate confidences were I to give the figures privately communicated or obtained from the books of the Akron and other furnaces; but it may be said that, even at the lowest prices in 1878, the iron from these furnaces yielded large profits, and that the cost of production is very low. The net price paid for mining coal at the side of the furnaces is 43 cents per ton, and the royalty paid is 10 cents. When the ores near by, yielding from 30 to 40 per cent of iron, are mined by contract at from 60 to 70 cents, and at most $1 a ton, it is easy to see that the conditions are exceptionally favorable. The experience already gained, however, shows that here, as elsewhere, some care must be exercised in the selection of ores, and also in the location of the furnaces with reference to a supply of water. The use in the furnaces of coke made from the coal seams just above the Great Vein will probably be found of considerable advantage when mixed with the raw coal from the latter, for iron smelting.

The exports of coal from the Great Vein in this region are considerable, and increasing in amount; a single railroad, the Columbus & Hocking Valley RR., in 1878 having carried of it 914,000 tons. Of this a large part finds its way to the lake ports, whence the ores of Lake Superior can be

* Abstract of a communication to the Institute of Mining Engineers, Baltimore, February 18th, 1879.

readily brought. These in the future, it may be expected, will not only be used in admixture with the native ores, but, smelted by themselves with the cheap coal and coke of the region, will afford materials for the manufacture of Bessemer and open-hearth steels.

HOWARD'S FORK, SAN JUAN, COLO.

By F. J. Kramer, U. S. Deputy Mineral Surveyor.

I have not noticed our camp mentioned in the ENGINEERING AND MINING JOURNAL. It certainly can not be because it is not of enough importance. Most likely it is of so recent growth that your regular correspondents, have not, as yet, become acquainted with it. Howard's Fork, in the San Juan country, is not more than two years old, and it was only last year that it attained any prominence for the number and richness of its lodes.

The Howard's Fork is a branch of the Rio San Miguel, and in the mountains at its head are found the lodes mentioned below. Our camp is situated in Ouray County, about thirty miles southwesterly from the town of Ouray. The nearest town of importance is Silverton, distant about fifteen miles by way of the burro trail.

The first lode discovered on the Howard's Fork was the Osceola, a rich gold lode. A sack of ore containing about a hundred pounds brought five hundred dollars at Greene's smelter in Silverton. During 1877, there were discovered, Nevada, What Cheer, Valley View, Summit, Sulphurets, Staadtsburg, and Santa Cruz, all of them mines that shipped more or less high-grade ore last year. The ores of the Nevada and What Cheer are galena and gray copper. Their galena ore is especially sought after by the smelters, because of its freedom from deleterious substances. The ores of the Valley View and Summit are galena and sulphurets. Last year the first-class ore of the former had mill-runs as high as 530 ounces to the ton.

The biggest strike made last year was the Parsons lode. This was discovered by Messrs. Gray and Parsons, both men who had never prospected before. An old prospector, after inspecting the ore piled up in the Parsons ore-house, said to me: "No man who had prospected three months would have ever thought of locating this lode. It showed no defined crevice on the surface. They dug into the mountain, found some rich mineral, and this kept them at it. Now it is the biggest thing on the Howard's Fork."

Some of the sample lots of the Parsons lode shipped to Ouray run 694 ounces. One lot of ore, shipped to Lake City, but not closely sorted, had a mill-run of 331 ounces. During the winter, this lode has been worked by two men. Within six weeks, some forty tons of ore were taken out. A short time ago, one man, for a week, averaged more than a ton of ore per day. The lode has been tapped, at a depth of about fifty feet, by a cross-cut tunnel. On one side of the tunnel the lode exposes thirty-two inches of solid mineral, while in the level, on the other side, it has averaged about fifteen inches.

The Parsons is not the only lode discovered last year. The Honduras, San Bernard, Gopher, Susan Emma, San Juan, Fox, Kent, Montezuma, and a number of others were discovered last season. About thirty lodes shipped ore last year, while about as many more have fine mineral in sight, but have not shipped on account of the lateness of the season when discovered.

With the exception of about a dozen, few of our lodes were much developed last year. Our prospectors were so busy prospecting and working the assessments on their various lodes, that they had no chance to develop any one of them. Many of our prospectors are interested in as high as twenty-five lodes, while ten is not a high average. Of course, with such a state of things, our lodes are not developed rapidly, unless they show very high-grade ore in the assessment holes.

In a country so completely undeveloped as ours as yet is, none but high-grade ores will pay. Last year, hundred-ounce ore left nothing to the miner. The smelters were at a distance, and charged high prices for the treatment of ores. The absence of wagon-roads required the ore to be shipped by burro trains, and the cost per ton was from twenty to fifty dollars. Notwithstanding this, a large amount of ore was shipped—a sure proof that the Howard's Fork possesses rich lodes.

Next year, wagon-roads connecting us with the outside world will be built. Their construction will present no insurmountable difficulties; all that will be required are a certain amount of capital and enough push. The push is not wanting among us, and the capital will be forthcoming in due time.

Besides the reduction in freight that will be produced by wagon-roads, there will be a reduction by the near presence of smelters. We are promised two smelters next year, one of them, I believe, being even now on the road. The reduction in expenses this will produce will open up a number of mines that, under present circumstances, do not pay. The difference of fifteen to forty dollars a ton in freighting will frequently make the difference between a paying and a non-paying mine.

Two smelters will be far from sufficient to reduce the ore that will be produced by this camp. At this writing, there must be over five hundred tons of ore on the dump. The Parsons lode has over a hundred tons, and, at the present rate of production, will have more than tripled this by spring. The Osceola has over a hundred tons taken out. Six men have been all winter at work on the What Cheer and Nevada lodes. They must have taken out a considerable amount of ore so far, and their output after this will be considerably increased, as they have struck a new streak of considerable size. The Sulphurets has four months' output on the dump. The Honduras and San Bernard have, at the present time, ready for the market, the ore taken out of more than a hundred feet of tunneling. The Alta, on Turkey Creek—a great producer last year—must have by this time a large amount of ore taken out; but, owing to its isolated position, nothing definite is known. Nor must the Hawkeye and Santa Cruz be left out of consideration, although at present their ore-pile is not so large as the others.

When, with the small forces now at work, such a showing up can be made, what may be expected next summer, when for every man now at work on these lodes at least five will be employed? Who can predict the amount of ore that will be turned out when stoping begins, and when three of the great producers of last year, namely, Valley View, Summit, and Staadtsburg, at present not worked at all, shall put on large forces? What may we hope for when the numerous lodes, upon which assessment work could only be done last year, shall begin to put out ore? With such a prospect, I firmly believe that Howard's Fork is destined next year to be the liveliest camp of the San Juan.

So far, I have only spoken of the silver lodes of this district, and have only incidentally mentioned that gold had been found. Several gold lodes were discovered early, but they caused little or no excitement. The discovery of the Gold King, however, did away with the apathy regarding gold lodes. The Gold King was relocated some time in August, after a rich pocket had been discovered, the quartz of which fairly sparkled with free gold. An assay showed thirty thousand dollars to the ton. The pocket produced several thousand dollars' worth of ore before it gave out. Although all the ore in the Gold King is not so rich, it is a lode that promises to enrich the company that will put up stamp-mills and work the lode rightly. Such a rich strike as the Gold King led to prospecting for gold lodes, and in rapid succession were discovered a number of lodes, all carrying more or less free gold. Chief among the gold lodes are Gold Queen, Gold Prince, Powhatan, Globe, Gold Maid, Atlas, Gold Shaft, Rainbow, and Greenback, the latter owned by the only members of the greenback party in our camp.

Last fall, three *arastras* for treating the gold ore were erected. Four more are building during the winter, and next year we shall see more than a dozen arastras busy at work at the ore from our gold lodes.

Our lodes are far from being all discovered, even on the Howard's Fork. There are two districts in our immediate neighborhood that have hardly been entered upon. One of these (Wilson Creek) is thought by one of the best gold prospectors of the San Juan to be the source of the gold of the placers of the lower San Miguel.

A NEW METHOD OF SMELTING CUPREOUS PYRITES.

EDITOR ENGINEERING AND MINING JOURNAL:

A paper of no common interest was read, last month, before the Society of Arts (London), by Mr. John Hollway. Its title, "A New Application of a Process of Rapid Oxidation by which Sulphides are Utilized for Fuel," but partially describes its purport. It is, in fact, a description of a new method of smelting iron pyrites containing a small percentage of copper, in which the heat evolved by the oxidation of the sulphur and iron in the pyrites is used to effect the fusion, and in which the sulphur not oxidized is volatilized and condensed in the metallic state.

In cupola smelting, as ordinarily conducted, the sulphides to be treated receive a preliminary calcination which deprives them of most of their sulphur and oxidizes, in part, the iron. A mixture of the roasted ore with fuel is then exposed in a shaft-furnace to a low-pressure blast, which maintains at and above the tuyeres, by means of the fuel, a heat sufficient to fuse the ore to such fluidity that its constituents combine into matte and slag, and these, flowing into the crucible, separate according to their respective gravities. During the passage of the ore down the stack, only a small proportion of the residual sulphur is oxidized; for, owing to the porosity of the descending mass, much of the air escapes free from the stack mouth.

Mr. Hollway conceived that, as in the Bessemer process, heat sufficient to maintain iron fluid is produced by the oxidation of the carbon in the pig, when the oxidation is effected rapidly by the transmission through the fluid mass of a blast of air; therefore, by driving air in a similar manner through molten cupreous protosulphide of iron, the oxidation of the sulphur and iron would maintain a smelting heat, the sulphur would be rapidly eliminated, and the iron combine with silica, if present, to form slag, and the copper retain sufficient sulphur to make a matte. In carrying out the idea, he first ran down with coke, in the ordinary way, 5 tons of pyrites in a cupola, and discharged the metal into a 6-ton Bessemer converter. The pressure of blast in the converter in different experiments was from 10 lbs. to 20 lbs., and the former pressure seemed sufficient. The first blow lasted 30 minutes, and produced a clear slag, which, on cooling, exhibited splendid crystals of ferrous orthosilicate and a copper matte. The silica was supplied by the gannister lining of the converter, which was therefore much injured. In the second experiment, the blow lasted only 15 minutes, and, to save the lining, sand was thrown into the converter. The result was a slag of exactly the same composition as before and a 43 per cent copper matte.

The temperature of the escaping gases rose rapidly in the several experiments from 60° and 70°, to from 690° and 720°. The composition of the escaping gases could not be very thoroughly ascertained; but from the rapidity with which the iron melted at the furnace mouth, and the absence of any oxygen in the test tubes, it is supposed by Mr. Hollway that one half the sulphur is volatilized, the other half being oxidized into sulphurous acid. The volatilized sulphur he proposes to condense, and to recover the sulphur from the sulphuric acid by means of sulphureted hydrogen.

Having succeeded in keeping the charge of previously melted pyrites fluid, he next endeavored to melt crude ore in the converter by introducing, to begin with, a small charge of molten metal; starting the blow, and then adding ore and silica in lumps as fast as they melted down. He thus ran on one occasion for eight hours, with an intermission of only 20 minutes to repair a burst pipe, during which stoppage the charge did not solidify. He obtained, as before, a protosilicate slag and a rich copper regulus, in which was concentrated what precious metals the ore contained.

The least satisfactory portion of Mr. Hollway's paper is that in which he goes into exact calculation of cost of plant and working expenses for treating three hundred thousand (300,000) tons of Spanish cupreous pyrites per annum. In his experiments he came face to face with several serious difficulties which must be overcome before his method can be pronounced as beyond the experimental stage; foremost, the difficulty of finding a lining which will resist the corrosive action of boiling protoxide of iron. He worked with a Bessemer plant. Its presence should have reminded him that a metallurgical method may be very nearly while yet very far from perfect, and that the hosts of foes which beset the metallurgist are never defeated in a single fight.

He and all his critics admit that a furnace with a hearth in which the

products of fusion can collect and arrange themselves and from which they can be tapped off continuously or at intervals without stopping the blast, must be devised; but it can hardly be supposed that Mr. Hollway can succeed in constructing such a furnace without many a failure and much expenditure of time.

If he succeed in working out the problem he has set himself, he will rank with the little band of great men who have introduced radical innovations into the most conservative of all arts—metallurgy. If he do not succeed, he has at all events published a series of well-made experiments which can not fail to bear, sooner or later; practical results.

J. D., JR.

AN IMPORTANT DECISION.

[Extract from the decision of Judge Hallett, in the case of the Colorado Central (G. W. Hall, *et al.*) *agt.* the Equator Mining and Smelting Co. Rendered in the United States Court, Colorado, February 3d, 1879.]

* * * As to all of the disputed ground, the principal question affecting the whole lode is whether by locating a part of the width of outcrop the whole may be taken—of several collateral locations on the course of a lode where the top or outcrop is of sufficient breadth to admit of more than one, are not all of equal dignity and force within their own lines? This question will admit but one answer, with such modification as may be hereafter suggested. The act of 1872 certainly requires a location to be along the course of the lode and to include the top of it, and it is believed that the act of 1866 is of the same effect. Defendants' location was made under the act of 1866, and probably some discussion of that view of the act would be appropriate in this connection. But it may be enough to say that defendants assumed to take the whole lode into their location; and if they failed to get the whole, either by their own omission or because of some restrictive provision of the local law, the result is the same. In either case, they can not now claim more than was taken by the location. The same rule is applicable to plaintiffs' location, and as to both of them it is no answer to say that the law would not admit a location of sufficient width to take the whole lode. If the law is illiberal, it is not for that reason the less controlling. If, however, a right to the entire lode can not be asserted under a location covering a part only of its width, as seems to be obvious, the location may be valid for the part described in it. If it is on the top of the lode, it is within the act, and so it ought to be good for the part within the lines extended downward, vertically, if for no more. Generally it may be said that a patent for a lode, issued under one of these acts, will convey all valuable deposits within the tract described, except such as may belong to lodes and veins which outcrop elsewhere and come into the tract in their downward course. *Prima facie*, the patentee must be the owner of all that lies within his lines. He has also the right to pursue veins and lodes which he holds by their outcrop into other territory, but in that the burden of proof is cast upon him to show the origin and continuous course of the vein out of his own land. Adjacent owners may equally invoke the rule which protects their possession, and demand full proof of the right to enter their territory. That is to say, every owner by patent shall be sovereign in his own domain; and whenever he goes beyond it, he shall recognize the equal right of others to the same protection. And thus it may be true that each of several locators on the same vein or lode will own all within his lines without being able to go beyond them. For as to his right to go into other territory, he can only do so in pursuit of a lode or vein that has its top and apex wholly on his own ground, and, having but a part of the lode in his territory, he can not comply with that condition. This appears to be a clear inference from the language of the act. The right given relates to veins, lodes, and ledges, the tops of which are inside the surface lines, which obviously means the whole and not a part. If, then, two or more collateral locations made on one and the same vein, and the vein, appear to be homogeneous throughout its width, we are authorized to say that each shall be confined within his own lines drawn down vertically. But what shall we say when there are veins within a vein or lodes within a lode, or when, as in the great Comstock, the vein is on one side of the lode, and a considerable body of crevice matter on the other side?

The occurrence of veins in other veins, applying the word first to the sheet of ore which is often called the pay-streak, and again to the general mass of the crevice embracing the ore and gangue, will not be controverted. In this case, the witnesses have spoken of several veins in the crevice matter, using the word in its restricted sense to describe the ore as distinguished from the great body of the lode, and this is a matter of ordinary experience in the courts of the State, as we all know. This corresponds with a definition found in Webster's Dictionary, where it is said that the word is often limited in the language of miners to a layer or course of metal or ore. So, in works on topography, fissures are mentioned as occurring within other and probably older fissures, which if filled may furnish the conditions of a vein within another and larger vein. It may be that the word is generally applied to the whole body of the crevice; but if it is also used in a restricted sense to designate the sheet or mass of ore in which the pay is found, it may be taken to mean the last as well as the first. I have not heard the word lode used in the same sense; but as it means only a vein carrying ore, it would be even more significant than the latter. The word ledge is not in use with us, and, therefore, it affords no light as to the proper construction of the words with which it is associated in the act. As found in the acts of Congress, I think that the word vein may be taken in the limited sense to which reference has been made, as well as in the larger, and perhaps more usual, meaning of a crevice, belt, or zone of auriferous or argentiferous rock. To give effect to it in that way, we need not resort to the nice definitions and subtle distinctions of geological science. It is enough that such is an accepted use of the word among miners, and that it appears to coincide with the intention of Congress. So understood, the word vein, in the Equator patent, may refer to the sheet or crevice of ore that was found on the south wall of the lode; although, by reason of the narrowness of the location, it can not be said to refer to the entire lode. So also the word vein in the Central patent may be regarded as referring to the sheets and bodies of ore found in plaintiffs' openings, although for the same reason it can not apply to the whole lode. If all the ore in the lode had been found on the foot-wall, a location at the top would certainly be sufficient to carry the vein, although it might depart on its dip from the lines of survey. No one would then contend that a location to the northward, although on crevice matter, and although the locator should come on the vein in its dip, would thus acquire a right to it. The circumstance that bodies or sheets of ore have been found in the No. 5 and Central ground to the north, so long as there is no union of such bodies with that on the south wall, in no way affects the ownership of the latter. It stands as if no other vein had been discovered in all the lode; and the question is whether, after discovering and locating that vein, the defendants may follow it in its downward course, as distinguished from the lode, or the greater vein, if that word is preferred, of which it is unquestionably a part. If the ore had been distributed throughout the lode (using that word to describe the belt or zone of crevice matter) with any thing like uniformity, we should be unable to distinguish between the several parts, and, as we have already said, each party would then be confined to their own lines. But the vein on the south wall is, according to the evidence, quite distinct from the general mass of the crevice, and of such strength and continuity as may give it unity and individuality in law and in fact. There are several spurs or off-shoots coming in from the north which do not appear to affect the character of the vein. And there are some indications of a probable union and consolidation of all the ore-bodies west of the present development; but of these things we need not speak. In deciding this cause, it is enough to say that the vein on the south wall may be held as a separate and distinct location, with the right to follow it in its downward course so long as it retains its individual character. If it shall be found to unite with another vein in the same lode, the rights of the parties will be governed by those principles which are applicable to the union and intersection of distinct and separate lodes. All that has been said respecting this vein is based on the fact, as shown by the evidence, that its top and outcrop are wholly within the Equator ground. * * * *

If the top and apex of the vein had been found within the Central lines, some questions would arise which were submitted to counsel concerning the force and effect of the patents within the space covered by both locations. In the view which has been taken of the case, however, it has not been found necessary to discuss those questions.

Briefly to recapitulate all that has been stated at length, we may say:

First. That the vein on the foot-wall is so far distant and separate from the general mass of the lode that it could be taken and located without including the entire lode in such location.

Second. That the top and outcrop of that vein from the engine shaft west as far as the development extends, is within the Equator grounds.

Third. That defendants, having the top and outcrop of the vein in their territory, may follow it in its downward course into other territory, so long as it retains its individual character.

Fourth. There is no union or junction of veins within the Central ground as claimed by plaintiffs.

The judgment will be for defendants.

GOLD IN MIDIAN.

Niebuhr, the traveler, who was not wholly ignorant of Arabian literature, should have been better informed when he asserted "the precious metals are not found or known to exist in Arabia, which has no mines, either of gold or silver" (*Description de l'Arabie*, page 124, Amsterdam, 1774), and as Niebuhr's reputation rose high, his dictum has been universally accepted by the writers, scientific as well as popular, of the last half-century. There could be no greater mistake. Dr. Ad. Gurlt, of Bonn, a *savant* who is preparing for publication the "History of Mining and Smelting," remarks, in a letter addressed to me, that Midian shows (in literature) traces of the industry which, under the Phœnicians, Egyptians, Romans, Nabathæans, and Arabs, has lasted nearly 2000 years. He has kindly forwarded the following notes upon his authorities: Moses (B.C. 1852) mentions, among the metals which were purified by fire after being plundered from the Midianites, tin, an ore of the greatest importance, considering the part it plays in the bronze arms, instruments, and implements of ancient nations. In Numbers 31: 22, we find—besides tin—gold, silver, brass (copper?), iron, and lead. All these metals were rediscovered by the second Khédivial expedition to Midian. Rameses III. (B.C. 1000) of the twentieth dynasty, in the eleventh year of his reign, opened the great mines of copper in the land of 'Athaka ('Akabah). According to the Harris papyrus (British Museum), translated by Eisenlohr, the ore was yellow as gold (pyritic copper?), while the Sinai diggings yielded only Mafkat, green copper ore (= chrysocolla?). You will find the description in Dr. Beke's *Sinai in Arabia;* and my last work, *The Land of Midian Revisited*, has copied the original hieroglyphs. Dionysius Aphrus, a Greek geographer of Augustus's day, and interesting to us because he is the first classic that notices our coal treasures, declares of Arabia behind the Libanus and in the Nabathæan country: "Indeoque ipsa regio tantis hucusque floruisse muneribus dicitur, ut ejus montes aurum pariant, et flumina convehant argentum, eorumque ripæ thymiamate et fragrantibus herbis redolent, atque qui ibi victitant maximas possident opes, neque induunt nisi paludamentis aureis, aut sericis quam mollissimis. Verum qui primam Libani montis frontem tenent, ipsi sunt qui Nabathei sunt appellati." From this it is evident that Northern Arabia was meant. (Translated by the Veronese Antonius Becharias, and printed by Henricus Paulus, at Basel, A.D. 1534, page 53.) Pliny only says, of Arabia, "Litus Hammæum ubi auri metalla." ("Nat. Hist.," iv., cap. 32.)—*Richard F. Burton, in Athenæum.*

DESERTED TOWNS IN NEVADA.—There are deserted towns in Nevada; but they are not old ones. A few years ago, the population of Hamilton is said to have been nearly 8000; of Treasure Hill, 6000; of Shermantown, 7000; of Swansea, 3000. All were incorporated, with mayor, council, fire departments, and daily newspapers. Hamilton has now about 100 inhabitants, most of whom are merely waiting in dreary inaction for something to turn up. Treasure Hill has about half as many; Shermantown one family, and Swansea none. In one cañon of the Toiyabe range, near Austin, are five dead towns without a single inhabitant. The streets and blocks graded on the hill-sides are rapidly falling back into the wilderness.

PROGRESS IN SCIENCE AND THE ARTS.

General Science.

The Effects of the Continuous Administration of very small Doses of Arsenic to domestic animals has lately been carefully studied by C. Gies, whose account of his experiments appears in the London *Lancet*. The results, which we briefly condense in the following paragraph, are highly instructive. The duration of the experiments was four months, and the doses administered were extremely minute (varying in the case of rabbits from ·0005 gram, and with pigs from ·005 to ·05 gram). The noticeable effects were, that the weight of the animal increased in every case; the subcutaneous fat was augmented; in the case of growing animals, the portions of the bones usually spongy were speedily replaced by compact bone, and the same tendency was noticed with extremities usually cartilaginous. Besides these changes of the bony structure, it was observed that the heart, liver, kidneys, and spleen had undergone pronounced fatty degeneration. Even in the young of these animals—which, by the way, were invariably born dead—the beginning of similar changes could be observed. The regular use of arsenic preparations for the production of a fine complexion and a pleasing plumpness, which is said to be a not uncommon practice with those of the fair sex who are not content with the gifts that nature has bestowed upon them, would therefore appear, in the light of these instructive investigations, to be most dangerous, and the practice should be condemned.

Improvements of the Telephone.—Prof. Righi's telephone, according to published accounts of its performance, must be by far the most remarkable apparatus of the kind that has yet been produced. It reproduces the sounds of the human voice with marvelous distinctness, even at a distance from the receiving instrument, so that many persons (and even large audiences) may hear spoken messages or addresses delivered at the other end of the line; and is said to possess the additional and unique advantage that when once adjusted it remains in perfect working condition without attention for an indefinite period. These advantages may be explained by the peculiarity in the construction of the device for transmitting sounds, the diaphragm through which the waves of sound are sent resting upon a conducting substance made of a mixture of metallic silver in the state of impalpable powder, and finely-pulverized carbon, all mounted on the extremity of a very slender spring. For a full description of this latest telephone marvel, which was first brought out by its constructor, in Bologna, Italy, we refer our readers to the *Scientific American* for March 22d, from which journal we also glean the fact that Prof. Gray, whose name will be familiar with our readers, has just patented a combination of the telephone with the ordinary Morse instrument, which allows the operator to communicate over the same line, either by the usual Morse signals or by the voice at pleasure.

At the February Meeting of the Franklin Institute, Mr. P. H. Dudley explained a method that he had devised of synchronizing clocks for different longitudes, from a central station, and explained his method of constructing diagrams illustrating graphically the lowest rates at which railroads can carry freight. Our readers are referred to the *Journal* of the Institute for details. At the same meeting Mr. John Richards read an important paper on "Measuring and Gauging Implements," describing the tools made and machines employed by the American Standard Gauge and Tool Works, of Philadelphia.

The Latest Notable On Dit relating to the electric light is the statement that it has been experimentally tried in the great reading-room of the British Museum. The result is reported as having been successful. Eight Jablochkoff candles were used, and the room was very brilliantly lighted.

At the Port Richmond Wharves of the Philadelphia & Reading Railroad Company likewise, the electric light was lately experimentally tried on board the steam collier Harrisburg, to test its use in permitting the loading and discharging of vessels at night by its aid.

The First Telegraph Line for the transmission of *public* messages in China is now being constructed under the superintendence of Mr. J. A. Betts, Director of the Imperial Torpedo College, at Tien-tsin. It will be about 40 miles in length, and will probably be completed within the next three or four months. The credit of this progressive action is ascribed by general testimony to the enterprise and wise policy of the Viceroy Li Hung Chang.

The Project for a Pacific Submarine Cable, to connect the West Coast of America with China and Japan via the Sandwich Islands, does not appear to have been abandoned; as we learn that an agent for the American projectors is now at Tien-tsin, for the purpose of securing the aid of the Chinese government. The Japanese authorities are reported to stand committed to its support.

Cowper's Telegraphic Pen, an invention to which we lately referred, and which seems to possess unusual merit, was exhibited for the first time to the public at the last meeting of the "Society of Telegraphic Engineers" in London. As the telephone permits one to converse by wire, so this invention enables one to write by wire.

A full description, with illustrations of Mr. Cowper's invention, will be found in the *Telegraphic Journal* of March 1st, to which we refer our readers for details. The *Journal* concludes its account of the invention in the following flattering terms: "The advantages of Cowper's writing telegraph are obvious on a little reflection. It will supplement the telephone in business by giving *written* orders, or it will be useful in the field as a copying telegraph; while for private and confidential purposes, it will be valuable, since any unskilled person may use it, and secret marks may readily be sent."

The Gas and Water Pipes of dwellings, according to M. Gregory, can be used successfully as a source of electricity for a microphone. He reports to the *English Mechanic* that he has tried connecting one of his microphone wires with the gas-pipe and the other with the water-pipe, and finds the current ample and constant.

Mining and Metallurgy.

The Extension of the Uses of Steel, which of late has been so much commented upon, appears to have exercised abroad a no less important influence in diminishing the production of iron than at home. The most recent reports to hand show, for example, that the growing applications of steel have had the effect of reducing the production of the item of iron rails in Wales about 90 per cent, and that of the north of England to almost nothing. This is almost a repetition of the story that our statistics of home production tell.

A Combined Reverberatory and Bessemer Converter has been designed and patented by Krupp, of Essen, Germany, for the purpose of facilitating the working of pig-iron by the Bessemer process, which would otherwise make too cold a blow. The apparatus in question enables him to blow or heat the metal at pleasure. The account of the construction, which we condense from the *Iron Age*, represents it to consist of a flattened converter with large neck, and heated by Crampton's dust-firing arrangement, or by a Siemens rotator. When turned horizontally, this converter becomes a reverberatory, and illuminating gas is at the same time turned on automatically for heating purposes. In working, for example, white pig, it is first overheated with the apparatus horizontal; then the converter is turned up, and the charge blown, after which scrap as required is added.

A Continuous Hoop-Mill, invented by Mr. Bernard Lauth, of Pennsylvania, has been introduced into two large establishments in this country (the Bethlehem Iron Works and Howard Iron Works) with great satisfaction, and is about being started in a third (the National Tube Co.'s Works, at McKeesport), for rolling skelp iron, for which it is likewise adapted. The machine at Bethlehem has rolled 15 hoops, 60 feet long, in one minute, with one unskilled laborer and four boys as attendants; while the best work on the old hoop train is about 8 hoops per minute, requiring 5 skilled laborers and four boys to a train. The machine will also roll a hoop of any size, while in ordinary mills the rolls must be changed for every size of hoop. Our authority for the above is the American Iron and Steel Association's *Bulletin* of March 12th.

Steel from Cleveland Ore.—Among the interesting items of technical news during the past week is the statement that Messrs. Bolckow, Vaughan & Co., a prominent firm of iron and steel manufacturers, had succeeded in certain experiments they had undertaken to establish the feasibility of producing steel from Cleveland ore. The importance of this announcement, if it be verified, is apparent from the fact that iron can be made in Cleveland cheaper than anywhere else in the United Kingdom, and, it is affirmed, cheaper than anywhere else in the world; though hitherto no process has been found to produce steel from the Cleveland ore because of its inferior quality.

Apropos of the Increase of the Importation of Iron Ores from Algeria to the United States, to meet the growing demands of our Bessemer works for pure ores, and to which we made a recent reference in these columns, the *Iron Age* of March 17th has a very good editorial on "The Iron Ores of Algeria," giving a full account of these valuable deposits.

American Spiegel.—We learn from the *Bulletin* that the Oxford Iron Co., of Oxford, N. J., has lately started the smaller of its two furnaces on spiegeleisen, using its own ores as the base and supplying the manganese from Spanish ore.

Pig-Iron to China.—A sale of 100 tons of pig-iron by the Thomas Iron Co., for export to China, is noticed among the recent business items as being of interest from the fact that it is the first shipment of this kind from the United States to that country.

To Encourage the Development of its Coal Mines, the Japanese government is reported to have made the offer of a liberal subvention to capitalists who will engage to develop the coal deposits of the island of Yesso.

Chemistry, Physics, and Technology.

The Consumption of Rubber in the United States is reported to amount to about 12,000,000 pounds annually. Of this quantity the largest proportion is obtained from the Amazon region of South America, which furnishes the finest quality of this product; the inferior sorts come from Africa and Central America. The price of the crude commodity ranges from 25 to 50 cents per pound, according to quality. One half of the entire yield of South America comes to this country, and one manufacture alone—that of rubber shoes—consumes one half of our entire supply.

A Simple and Effective Signaling Apparatus, said to be in use on German naval vessels, is described in the *English Mechanic* as acting on the plan of forcing petroleum vapor, by means of a jet of air, into the colorless flame of a spirit-lamp. These jets produce a light of great brilliancy, and by interrupting them, which can be done at will by opening and closing a valve, the petroleum flame is caused to appear or disappear, and rapid signals thus communicated, according to a code previously agreed upon.

For Steeling Objects of Copper, Boettger recommends the use of ammonio-ferrous sulphate (100 pts.) and ammonium chloride (50 pts.), dissolved in 500 pts. of pure water, to which a few drops of sulphuric acid are added. Into this bath, kept at a temperature of 60° to 80° (R. or Fahr. ?), the copper object to be plated is suspended as the cathode of a system of 2 or 3 Bunsen cells, the anode being an iron plate equaling the copper object in size. The duration of the operation is very brief, three or four minutes sufficing to cover the copper surface with a hard, steel-like deposit of iron. This on the authority of the London *Engineer*.

Glass may be Coated with Copper or Silver, according to the recent French patent of Monot, by subjecting the objects to be decorated, at a red heat, to the reducing action of coal-gas, which causes a deposit of the metal on the surfaces exposed to its action. It is necessary that the glass should contain an oxide of the metal which it is desired to deposit.

Threads of Glass are produced by a process devised by Herr Prengel, of Vienna, which are affirmed to be so pliable, and at the same time so tough, that they may be spun and woven into the most delicate fabrics.

The Use of Chlorophyl as a substitute for copper salts, for imparting the green color so much desired in preserved vegetables, etc., is the subject of a late French patent. Chlorophyl is the universal green coloring principle of plants, which the inventors prepare in a soluble form.

Engineering, Mechanics, and Miscellaneous.

The Introduction of Steam Motors as a substitute for horse traction

on street railways, and which appeared some time ago to be rapidly growing in popularity, seems to have made, after all, but little substantial progress. The Market Street City Railway Company, of Philadelphia, which during the centennial year made a very thorough test of a number of such steam cars of the self-contained type (in which engine and car are combined), at length withdrew them from service, for the alleged reason that the expense of maintenance was too great where only a few were in use. Whether this class of engines met with better success in other places, we are not at present advised. It is worth noticing, however, that the same company is now experimentally testing a light steam-engine that is coupled and detached to the common street-car just as horses are. This plan appears to us to be the only one thus far proposed that promises to afford a rational solution of the steam street-car problem. It admits of the use of the present cars, which the costly self-contained steam-cars do not permit, and this fact, as our engineer readers are doubtless aware, is the most serious obstacle in the way of introducing steam on city railways, since the substitution of specially constructed steam-cars would render the present rolling stock, in which large amounts of capital are locked up, practically valueless. An accident to either the car or the engine of one of these self-contained affairs lays up the whole apparatus for repairs; while an accident with the detachable or independent system might lay up a car or an engine, but would leave one or the other free for use, as the car could be coupled to another engine, or *vice versâ*. Views precisely similar to these were long since pronounced by our contemporary, the *Railroad Gazette*, and the result has verified the practical value of its professional opinion.

Fire-Proof Buildings.—The *Scientific American* of recent date indulges in some very sensible remarks upon the expensive folly of constructing buildings with little or no regard to the prevention of their destruction by fire. Our contemporary points its moral with the startling statement that it costs the United States $200,000 a day for the maintenance of town and city fire departments (this does not include the first cost of apparatus and equipment); and urges the necessity, on the part of city and town authorities throughout the country, of enacting and enforcing the most stringent laws respecting the proper construction of buildings, that the wholesale spread of fires, now so common an occurrence, may be prevented; a condition of safety which the experience of other countries shows to be quite within the range of possibility to attain. The article concludes with the statement that, "If preventive measures were thus made imperative for a decade or so, the country would soon be able to save a considerable portion of the $100,000,000 a year now directly or indirectly sacrificed to the 'fire-fiend.'"

A Dynamite Shell that can be projected against the hull of a ship, and insure its destruction or, at least, its serious damage, is affirmed to have received the favorable opinions of the Russian naval authorities, who, in view of the notoriously bad record of torpedo-boats during the late war, in attacking the war-ships of the Turks, and the great improvements that have been made of late years in devising effective modes of defense against this form of attack, have been engaged in devising some plan of employing explosive charges against hostile vessels. The invention of the dynamite shell above alluded to is said to have given them great satisfaction. A more detailed account of this novel weapon of offense appears in the Boston *Journal of Chemistry* for March.

The following notes are from the last number of the *Journal of the Franklin Institute:*

SOLUBLE GLASS IN BRONZING.—Böttger varnishes objects of wood, porcelain, glass, or metal with soluble glass and then shakes bronze powder over them.—*Dingler's Journal.*

BLEACHING DIAMONDS.—Ch. Riballier recommends heating gray or brown diamonds with carbonate of lime and powdered coal in air-tight crucibles, and allowing them to cool slowly.—*Dingler's Journal.*

GALLIUM BATTERY.—J. Reynauld has succeeded in making a battery of liquid and solid gallium by means of a metal solution of gallium sulphate. The liquid metal takes the place of zinc; the solid of copper; the former being negative in relation to the latter.—*Fortschr. der Zeit.*

EXPANSION TURBINE ENGINES.—A. Müller, of Cologne, connects a number of turbines in a common casing, the diameter of the turbines gradually increasing. The steam enters the smallest and escapes from the largest. This contrivance is said to be very economical either for steam or under a head of water.—*Dingler's Journal.*

TELEGRAPHING TO RUNNING TRAINS.—C. M. Gariel describes the successful working of Baillehache's invention for signaling to and from trains in motion, on a part of the line which connects the Champs de Mars with the station at Grenelle. The experiments were so successful that they are likely soon to be repeated on a much larger scale.—*La Nature.*

RETENTION OF HEAT.—M. Degremont glues upon cloth a series of small segments or rods of wood to form a sheathing for steam-pipe. It has the advantage of being easily removed and replaced, which is not the case with most heat retainers. Small, round-headed nails are used to prevent contact between the wood and the pipe, and to inclose a layer of air between the pipe and the sheathing.—*Bull. de la Soc. d'Encour.*

RENEWAL OF FILES.—The application of Tilghman's sand-blast to the restoration of worn-out files is becoming very general in Europe. A file of moderate dimensions requires only three or four minutes for renovating. The process can be repeated many times before the files need to be recut, and the sand-blast sharpening lasts six times as long as any other. The sand should be very fine and driven with great velocity.—*La Gaceta Industrial.*

INTERESTING EXPERIMENT.—On the 4th of August, Pasteur inclosed some vine-sets in hot-beds, almost hermetically sealed. The grapes ripened about October 10th. Grapes that had ripened in the open air fermented in less than 48 hours, in a temperature varying between 25° and 30° (77° to 86° F.), but those that ripened under glass remained unchanged. This result, which had been predicted by Pasteur, lends strong confirmation to his views.—*Comptes Rendus.*

ANCIENT MILANESE AQUEDUCTS.—In making excavations for a new system of sewerage, E. Bignami Sormani has found well-preserved remains of two ancient aqueducts, which were evidently used for conveying fresh water, probably for the supply of fountains and other domestic uses in early palaces or villas. The pipes are of terra-cotta, and Sormani is inclined to refer them to the time of the Roman empire, the form, mode of construction, and general details being indicative of a great antiquity.—*Il Politecnico.*

ALLOTROPY OF METALS.—M. Schützenberger, in his investigations of the different molecular states of metals, finds that other metals than antimony, especially copper, lead, and silver, take allotropic forms when precipitated from saline solutions, by electrolysis or otherwise. He predicts that this will prove to be the case with a large majority of metals. The less active and more stable modification is formed at the expense of the other, with loss of heat, like red phosphorus from ordinary phosphorus, or oxygen from ozone. Allotropic copper, when oxidizing in the air, takes brilliant rainbow hues, which may have a valuable industrial application.—*Bull. de la Soc. d'Encour.*

CHANGES OF SPECTRA.—If a small quantity of mercury is placed in a hydrogen Geissler tube, E. Wiedeman finds that an induction current gives the hydrogen spectrum at ordinary temperature. But if the tube is warmed in an air-bath, as the temperature rises the mercury lines appear, while the hydrogen lines grow fainter, and finally disappear. If a tube of hydrogen and nitrogen is warmed at any point, so as to free sodium or other metals from the glass, the hydrogen and nitrogen lines vanish almost entirely, while the lines of the metal appear. Does the hydrogen disappear, or is it transmuted into some other substance?—*Comptes Rendus.*

ELECTRO-CHEMICAL ACTION UNDER PRESSURE.—In a series of about 50 experiments, each of which continued for several hours, and during which pressures of 100, 200, 300, etc., atmospheres were maintained, A. Bouvet found the following laws: 1. The decomposition of water by a current is independent of its pressure. 2. The quantity of electricity necessary to decompose a given weight of water is sensibly the same, whatever may be the pressure. The laws are in perfect accordance with the mechanical theory of heat, the work being represented by the formula:

$$T = P\,V \int \frac{d\,v}{v} = P\,V \log.\ \text{hyp.}\ \frac{V_1}{V}$$

T, work; V_1 final volume; V, volume of compressed gas; P, pressure. Bouvet claims to have pointed out the principles of Cailletet and Pictet, in a memoir addressed to the French Academy October 8th, 1877. *Comptes Rendus.*

BOSNIA is improving under Austrian rule. The post-office has been put into working order, and a line of railroad is nearly completed. Bosnia is rich in unworked minerals.

ATOMIC WEIGHT OF IRIDIUM.—C. Seubert.—The author's determinations give as a mean result 192·744 (H = 1). He points out that Berzelius admits the presence of osmium in the iridium which he employed.—*Berichte der Chem. Gesellsch. zu Berlin.*

THE ELECTRIC LIGHT IN ROCK-SALT MINES.—One of the largest of the Great Marston salt mines at Northwich, England, was lately lighted with the electric light. The experiment was so successful that this method of illumination is likely to be adopted. The immense chambers of a salt mine afford an exceptionally favorable place for the use of the electric light.

The Plate-Glass Works at Louisville, Ky., belonging to W. C. De Pauw, are to be moved to New Albany, Ind., and consolidated with De Pauw's American Plate-Glass Works. It is reported that thirty-two annealing ovens and three melting-furnaces are to be added. When this is done, a double turn of men will be put on to keep up with the orders at the latter establishment.

TUNNELING THE HUDSON RIVER.—A bill has been introduced by Dr. J. J. Hayes, in the Assembly, the design of which is the establishment at the lower end of Manhattan Island of an underground railway depot or terminus, and to tunnel the Hudson River so that the great trunk lines may bring their freight right into the city instead of discharging it on the New Jersey shore.

AVERY'S ORIENTAL PORCELAINS.—A "private view" was given, March 17th, at a gallery on Broadway, New York City, of a fine collection of Oriental porcelain, owned by S. P. Avery, which has for the past six years been on exhibition at the Metropolitan Museum of Art. If not sold here intact to some institution or individual, it will probably be sent abroad. There are 1207 pieces, and the price asked is $35,000. March 18th, between ten A.M. and five P.M., is "ladies' day," and the exhibition will be open to the public March 19th.

MR. A. P. BLAKE, of Boston, is actively engaged in the organization of an extensive system of railway and steamboat communication through the interior of the peninsula of Florida. To promote the object of the new enterprise, which has been incorporated by the Legislature of Florida as the Jacksonville, St. Augustine & Indian River Railroad Company, the State has granted to Mr. Blake and his associates liberal facilities and large amounts of public lands. The road is to be a narrow-gauge, probably after the style of the Billerica & Bedford Railroad in Massachusetts.

DUST ON THE ATLANTIC.

About the latitude of the Cape Verde Islands on the Atlantic it is a frequent experience of voyagers to observe falls of red dust and a dry kind of mist. The material of the dust mass was examined microscopically many years ago by Ehrenberg, and his opinion was that small particles carried aloft from all countries here formed a transparent dust-zone from which they sometimes sank down, and in whirling movement came to the earth's surface. The material of observation open to Ehrenberg was somewhat scanty. The phenomenon has therefore been lately studied anew, and in a more thorough way, by Herr Hellmann, who examined the log-books of 1196 ships that had passed through the region in question during the years 1854 to 1871. He deals with the case chiefly from a meteorological point of view, and the following are some of the facts elicited. Most of the dust-falls occur in the zone of the Atlantic between 9 deg.

and 16 deg. north. South of 6 deg. north they are extremely rare, and the furthest south hitherto was in 2 deg. 56 min. north, 26 deg. west. The two furthest west were both in 38 deg. 5 min. west, both about three hundred miles from Cape Verde. Dust-falls often occur simultaneously at very different points of the "Dunkel Meer," or Dark Sea (as Ehrenberg called it); in one case they were 150 miles apart. They also often last for several days, for example, ten (April, 1859). Surfaces of very different size, up to 100,000 square miles, may receive dust-falls. There is a yearly period in the frequency of the falls. It seems that near the African coast most occur in winter; further west, in the early spring. The direction of the wind during dust-falls was from the east quadrant, and most frequently north-northeast to northeast. The dust-falls observed are very irregularly distributed over the years in question. Of sixty-three, taken at random, there were eight falls of sand and three of sand or dust. Sometimes sand and dust fall simultaneously. The dust-falls with great extent east and west are denser the nearer the African coast. In forty out of sixty-five instances the color of the dust was red. Sometimes there is no coloration. The dry mist of the Dark Sea is in causal connection with the dust-falls. Herr Hellmann concludes from the facts that the dust material comes principally from Africa and from the Western Sahara. The possibility of occasional mixture of particles from South America is not excluded. The distribution of the dust-falls, both in space and in time (they follow the movements of the trade-winds), supports the hypothesis, as also does the fact that the falling material is coarser in the East than in the West.

MONTANA MINING INTERESTS.

Special Correspondence of the Engineering and Mining Journal.

Montana, of all the States and territories, is the only one that has not a mile of railroad within her borders. Her prospects for securing one at an early date in the future are not *dazzling*. The Legislature of Montana has been in session for the past forty days, and has just adjourned. For the record and position this body established for itself and for the people of Montana, every citizen should hang his head in shame. The paramount and all-absorbing bill before the Legislature was a railroad one. The Utah & Northern RR., running north from Ogden, made a proposition to the Legislature, stating that, if they would pass a bill exempting any railroad from taxation, for a period of ten years, on all the road and appurtenances built within the territory before December 31st, 1879, they would guarantee to build the road to Helena within this time. Petition after petition came to the Legislature, praying that this bill might pass. The miners and large bullion producers came in person and showed the members by facts and figures the necessity of a railroad, to the proper development of Montana's immense mineral wealth; that the cost of production would be lessened: that large deposits of ore that would not now pay expenses would become paying property. And last, but not least, came the "fair ladies" in force, and prayed that the bill do pass, that we may be brought into closer communication with spring and fall styles. They sat through many a "tedious speech," and sought by their personal charms and presence to influence the passage of the bill. But this body, composed of the very "essence of wisdom," turned a deaf ear and the bill was defeated. Then Lewis and Clarke County generously came forward with a bill proposing to pay out of her own treasury all amounts assessed by taxation against the railroad by other counties through which it might pass, for a period of ten years. This bill met the same fate as the other. Your correspondent can only illustrate the "spirit of progress" that pervaded this body, by quoting from a speech on this bill by one of the members, who said, "I am fifty-four years old, never saw a railroad, don't want to see one, and will not vote for this bill." In spite of such a record as this, the same body decided to send out large numbers of pamphlets, setting forth Montana's agricultural and mineral advantages, and inviting foreign capital and immigration to her shores. Foreign capital will be very wary now of Montana investments, as she has placed herself on record as opposed to the great modern engine of development—the locomotive. The railroad authorities, on account of the treatment they received, have decided to run their road to Boise City, Idaho.

The following is a copy of the Bullion Bill, passed by the Legislature before adjourning. It takes the place of a vague law now on the statute-book. It will prove of interest to all persons who have money invested in Montana mines, and those who contemplate investments.

TUBEROSE.

AN ACT TO PROVIDE FOR THE TAXATION OF THE PROCEEDS OF MINES.

Be it enacted by the Legislative Assembly of the Territory of Montana:

Sec. 1. That every person, corporation, or association engaged in mining upon any quartz vein or lode, or placer mining claim containing gold, silver, copper, or lead, is hereby required, between the first and tenth days of August in each year, to make out a statement of the gross yield of the above-named metals from each of such mine or mines, being owned or worked by such person, corporation, or association during the year next preceding the first day of August in each year, and the value thereof; which said statement shall be verified by the oath of such person, or the superintendent or managing agent of such corporation or association; and deliver the same to the assessor of the county in which such mine or mines are situated, between the dates above mentioned. That said statement, verified as above provided, shall also contain the true and correct amount of the actual expenditures of money and labor in and about extracting such ore, the reduction thereof, and the conversion of the bullion derived therefrom into money or its equivalent during such year.

Sec. 2. That in making the statement of the expenditures mentioned in the foregoing section, such person, corporation, or association shall be allowed to include therein all sums of money that have been expended for necessary labor, machinery, supplies of every kind and character needed and used in his or its mining operations, for improvements actually necessary in and about the working of such mine or mines, reducing the ores therefrom, and expended in and about the construction of mills or reducing works used and operated in connection with said mine or mines for the purpose of reducing and extracting the precious metals therefrom; and shall not include any money invested in said mines or improvements made on the same during any year except the year immediately preceding such statement. Provided, that nothing herein contained shall exempt such improvements, mills, reducing works, and supplies from taxation as now provided by law. Provided, that the expenditures referred to herein shall not include the salaries, or any portion thereof, of the officers of any corporation not actually engaged in the working of such mine or mines, or personally superintending the management thereof.

Sec. 3. That a tax shall be levied annually upon the net proceeds of all mines above named, such net proceeds to be ascertained and determined in the manner provided in the foregoing sections of this act, and that such tax shall be collected and the payment thereof enforced as now provided by law for the collection of other taxes.

Sec. 4. That if any person, corporation, or association, engaged in the kind of mining named in this act, shall refuse or neglect to make and deliver to the assessor of the county where his or their mines are situated, the statement mentioned in the first and second sections of this act, during the time herein specified, the assessor of such county is hereby authorized and empowered, and it is hereby made his duty, to proceed to fix and assess, according to his best knowledge and information, the amount upon which the tax mentioned in section three of this act shall be levied in the manner now provided by law relating to the assessment of other property, and shall add a like penalty of twenty per centum to the amount and value thereof.

Sec. 5. That from and after the passage of this act no direct tax shall be levied upon any placer claim, quartz lead or lode, except to the extent of the price paid for any mining claim in obtaining patent therefor, from the government of the United States, and the only taxation of the proceeds thereof shall be that provided in this act. Provided that this act shall not be so construed as to exempt from taxation improvements consisting of buildings, erections, or machinery placed upon any quartz lead or lode, or used in connection therewith. Provided further, that the assessor shall, at the time of assessing any person, firm, corporation, or association, have the power to examine the books and accounts of said person, firm, corporation, or association, to fully satisfy said assessor that he has been furnished with a truthful report; and if satisfied from such examination that the report is false, he shall assess the same at the true amount of the net proceeds, so near as he can arrive at the same: provided that no one by virtue of the provisions of this act shall be deprived of his right to appear before the proper board of equalization as other tax-payers, under existing laws.

Approved February 21st, 1879.

GENERAL MINING NEWS.

ARIZONA.

THE TOMBSTONE DISTRICT.

The *Sentinel* says: "Advices from Tombstone, dated February 23d, report every thing progressing finely. The grade for the Tombstone Mining Company's mill was all ready, and the machinery was due on the day following.

"Work is progressing finely on the grade for the new 15-stamp mill of the Corbin Mining Co., and also on the road for hauling ore from the mines to the mills on the San Pedro River.

"The new main shaft of the Contention mine was then down about sixty feet. It is a double compartment, and will be ready for hoisting works in a few weeks. The Lucky Cuss is being put into working order. Some twenty men are employed and every day's work shows new and rich developments. The Toughnut mine works only eight or ten men. In the west shaft, and drifts running from it, there is now reported high-grade ore enough in sight to supply ten stamps for a year. The south shaft was down about eighty feet, and waiting for timber. A new town was being laid out at the Toughnut mine. The Head Center and Wedge have made the most remarkable developments lately. The first named has a cross-cut through thirty feet of good pay, which contains horn-silver."

THE SAN XAVIER MINES.

The Tucson *Citizen* of February 28th says:

"The property of the San Xavier Mining Company is about eighteen miles south from Tucson. The ledge is very wide—perhaps will average thirty feet—and the ore-body seems to extend the entire width. The Calabasas Land and Mining Company owns one mine on this ledge, and the San Xavier Company owns three claims."

The Blackburn gold mine, near Gila City, Arizona, is reported to be looking very well. The main shaft is now down over 90 feet, and sinking is being pushed night and day. Very fine specimens are said to have been sent to Yuma from there.

There seems little question but that Arizona is destined to become one of the largest mineral-producing sections of our country. We are constantly hearing of new discoveries; and many remarkable veins and lodes which attracted much attention years ago, but in consequence of their isolation and the danger from Indians, could not then be worked, are now coming forward, and Eastern capital is being steadily invested there.

The Moss lode, of Mohave County, is probably one that has attracted in the past as much if not more attention than any other.

Prof. B. Silliman visited this lode in 1864, and in an article which appeared in the *American Journal of Science and Art* for May, 1866, wrote as follows:

"The outcroppings of the Moss lode form a most conspicuous feature in the landscape, being seen, standing up in bold crests and pinnacles, from a long distance. * * * * * * * Subsequently, having an opportunity of comparing the physical features of the Moss vein with the surface show upon the 'Comstock lode' in Nevada, I was forcibly struck with the great resemblance of these portions of the Moss vein with that portion of the 'Comstock' which is still seen at Gold Hill south of Virginia City, where similar rich deposits of low-grade gold in the quartz outcrop gave name to the town which has since sprung into such wonderful activity as the result of the development of the mines which have been opened upon this remarkable silver vein. The inference seems probable that the explorations of the Moss lode will likewise develop a silver mine, and if the magnitude of the outcroppings affords any just ground of comparison, *the future of the Moss lode should not suffer in the contrast.*"

Prof. J. E. Clayton, under date of April 10th, 1877, says:

"From my personal examination of the outcrops of this immense lode, and from the statement of practical men of experience and well-known respectability as to the subsequent developments, I think there can be no doubt of its great value and permanence. With sufficient capital to open the mine thoroughly, and erect suitable reduction works, and the application of good, energetic, business management, this property should be made one of the great productive mines of the west coast. If it is not made to pay large dividends upon a proper investment, the fault will be in the *management*, not in the *mine*. I am confident that the mine will honor every legitimate draft made upon it."

We are informed that a number of prominent New York gentlemen have arranged to provide the means for the active development of this property, should the report of the expert who has been sent to examine it prove favorable.

COLORADO.

THE ALAMOSA CARBONATES.

From the Alamosa *News* of March 13th we glean the following: "Prospecting between Alamosa and Cat Creeks has been very lively during the past week. Two town sites, Montezuma and Carbonate City, have been laid off. The prospects for ore are very favorable, and the assays run well in silver. A ton of the ore from the Bloom lode has been sent to Prof. Hill's works for treatment. A large number of samples of surface ores show $15 to $30 per ton of silver, while some assays run from $300 to $400 per ton."

The Ouray *Times* of March 8th says that "a large deposit of carbonates has been found about 11½ miles below that town, and a mile from the River. So far the highest assay has been but $55 per ton. There is great excitement over the discovery, but there is not enough definite information to show whether it is to be of much importance or not."

It is said that quite a number of carbonate mines have been discovered in the

neighborhood of San Miguel City, among which is the Lothian mine, which has now on the dump one hundred and twenty-five tons. The lowest assay made gave 116 ounces silver per ton.

LEADVILLE.

This camp continues to be the great mining attraction of the country, and as the snow melts it is quite probable that the immigration will increase. A Denver *Tribune* reporter, in interviewing Lieutenant-Governor Tabor, elicited the following information: "Leadville and vicinity have a population of about 10,000. So far, there has been plenty of work for all who wanted it. Wages ranged from $2.50 to $4 per day. Miners get $3 per day and carpenters $4; teamsters, $35 per month and their board. It will be well for those intending to try their fortunes in this camp to postpone their location there until the middle of May, after the snow is off the ground. There are from 2500 to 3000 worthless men in the camp who do not want to work."

Good authorities think that there will be a very large demand for lead ores to use as flux for a large proportion of the ores of the camp which carry but little lead.

The accommodations for the increasing population are steadily increasing.

The Consolidated Mining Company has bought off the lessees of the Little Pittsburg. The lease extended to May 1st.

A "corner" was made in kerosene oil, and the price advanced from $2.75@$3 per case to $15, the speculators making from $1000 to $2000.

Owing to the difficulty in securing transportation, flour advanced from $3.50 to $4 per hundred. The roads are very soft, and the teams have had difficulty in pulling loads over them; $70 per ton have been offered for hauling hay from Colorado Springs.

The Denver *Tribune* of March 16th says: "In the United States Circuit Court in chancery sitting, yesterday, in the case of Trullinger *et als.*, *vs.* Stevens & Leiter, it was ordered that the premises in controversy—the Eureka lode and all workings thereon, at Leadville—be surveyed by Charles C. Baldwin for defendants, accompanied by Francis L. Vinton, Ed. C. Sandells, and Joshua A. Eads, as witnesses, and by George W. Nyce for plaintiffs, with George A. Gibson, William H. Yankee, P. E. De Loye as witnesses."

TEN MILE.

This camp, in the attention it is attracting, is but little behind Leadville.

The snow is here from five to seven feet deep on the level. There has been so little important work done upon the ore deposits that it is impossible to tell what the prospects are. The Robinson mine, however, is said to have 7 feet of mineral in the breast, averaging 150 ounces, and the Wheel of Fortune, 12 to 15 feet, averaging over 200 ounces. The Grand Union has a body of 12 feet of 100-oz. ore. The Big Giant and Smuggler mines have bodies of ore like the Grand Union. A recent discovery of galena ore on the Elk ledge gives 100 oz. silver.

The town of Kokoma erected 300 cabins in two weeks. This is a rival town to Carbonateville and Ten Mile City. The population is 500, and two smelters are projected. Lots have advanced from $5 to $200 and $300.

A saw-mill started work at Carbonateville, and has been running night and day since about this first of the month. There are six saw-mills projected for the district. The population of the town is said to be increasing at the rate of 50 per day. Lots sell at $50@$500 each. On Sheep Mountain there are said to be 50 mines which show mineral in veins from 3 to 24 feet in thickness. Some are shipping ore to Leadville at a cost of $30 per ton. The ore so far shipped has averaged 280 ounces silver.

A correspondent of the Denver *Tribune* says of the Wheel of Fortune mine:

"The present workings of the mine consist of a shaft thirty-two feet deep with four drifts twenty-five to forty feet long, running at right angles from the bottom of the shaft, all disclosing from twelve to seventeen feet of ore, with now and then a 'horse' of limestone in the vein, which dips about fifteen degrees from a horizontal position. At the mine awaiting shipment are about three hundred tons of ore, estimated to run from one hundred to five or six hundred dollars per ton. The ore has been treated at Leadville, but it will soon be smelted here at Ten Mile. The present managers are starting a tunnel to drain the mine and facilitate the work that is being pushed night and day with a force of about twenty men."

IDAHO.

THE SNAKE RIVER PLACERS.

A correspondent writing from Goose Creek, Cassia County, to the Boise *Statesman* under date of the 21 inst. says:

"The rush for the Snake River mines has already commenced, and I believe that this portion of Idaho is about to witness the creation of a new placer mining camp, that will equal in importance, if not exceed any other chronicled in the history of our territory.

"Thousands and thousands of acres of placer lands are being taken up.

"Paying prospects have been made over a distance along the river of from 250 to 300 miles, and in many places extending back from the river some two miles.

"The farmers in this section, in anticipation of the coming rush to these mines, are now energetically engaged in putting in crops.

"The usual method of collecting the gold is by means of electro-plated machines, several having been introduced in these mines by different companies with very satisfactory results. It is demonstrated that the high bars on the river pay about $4000 per acre. All the bars that yield twenty-five or thirty colors to the pan pay from $35 to $40 per day.

"Some Salt Lake companies are at work on the south branch of Snake River, about forty or fifty miles above the mouth of that branch. About 120 miners' inches of water is required to work a machine of ordinary size. The prices of the machines vary from $2000 to $3000. The gold is worth about $21 per ounce, being almost pure.

"Only a small section of the river has yet been tested by the new process; but it is known that the same character of gold is generally diffused throughout the gravel deposits along the entire length of this magnificent river. The cost of the machines, though apparently large to those who have been accustomed to the cheaper process, is a mere bagatelle when compared with the results that are sure to follow their general introduction."

THE BAY HORSE MINING DISTRICT.

The Tuscarora (Nev.) *Times-Review* says: "This district is 132 miles from Black Foot, the present terminus of the Utah & Northern RR. Chalis is the principal town in the district, and is the supply point for both the Bay Horse and Yankee Fork mining districts. There is a good road from the Utah & Northern RR. at either Black Foot or Market Lake. A large amount of ore was shipped from Chalis to Salt Lake last season. Ram's Horn mine, in Bay Horse district, averages $100 per ton of silver and 59 to 60 per cent galena. A number of mines are being opened in this district; but the principal mining camps are those of Yankee Fork district, 35 miles from Chalis, in the Salmon River mountains. Here is to be found some of the richest gold quartz. The Charles Dickens mine has one half million dollars' worth of ore on the dump and several millions of ore in sight. Mr. Norton, the owner, pounded out by hand $11,000 worth in one month, and, with an arastra with two beds, cleaned up $20,000 from select ore in six weeks' run. It is predicted by knowing ones that there will be from 5000 to 10,000 people in these placer diggings before the close of this year. California capitalists are taking up the mines here very rapidly. The Montana mine, in Yankee Fork District, has a 68-foot ore-vein. An average sample assayed very high. There are a number of other rich mines in this district, all with free-milling ore. Pack animals are used to get material to the mines and haul the ore over the road to Chalis—35 miles. The Californians, however, who have brought large interests into the region, are constructing splendid roads to the railroad points."

NEVADA.

THE COMSTOCK.

There is no news of importance from any of the Comstock mines. The Virginia City papers give the usual quota of favorable indications, and make the usual predictions that "something interesting may be expected" in every mine on the ledge; but there is nothing of any importance.

OREGON.

A new mining district is reported to have been discovered on Silver Creek, in Josephine County, about forty miles from Kerbyville. The first pan of dirt that was taken out yielded, it is said, three ounces of gold, and a nugget was found worth $104.

UTAH.

THE SILVER REEF DISTRICT.

We are indebted to the Salt Lake *Tribune* of the 15th inst., for the following:

"The Last Chance mine is one of the best-paying properties in Silver Reef, and belongs to the Stormont Company. A seventy-five-foot incline cuts the first level within twenty-four feet of the north end line. The average width of the ledge here is twelve feet. There is from here a 120-foot winze on the vein, showing, in places, rich ore, which is sacked in the mine. About 120 feet south from this winze is another in ore to the depth of 150 feet, and forty feet south from the bottom of this winze a 37-foot cross-cut is run west to the hanging-wall. In this drift from the last winze the ore is of a higher grade than in any other part of the mine. The working shaft is 112 feet deep, and cuts the vein about 450 feet from the apex of the ledge or reef. In the south chamber the ore, where now worked, is eighteen feet thick.

"The Stormont Company also owns the Stormont, and one half of the Manhattan, both of which are being worked extensively.

"Up to January 1st, 1879, there were worked by the Stormont mill 3740 tons of ore, producing 99,396 ounces of silver, valued at $114,261.42. In December, 1878, 1501 tons were worked, producing 43,040 ounces, valued at $51,918.08. In January, 1879, the mills were short of quicksilver, and the run made was far below the average. There were shipped $33,537.96.

"The Stormont is a ten-stamp mill, run by a 48-inch turbine wheel. There are six combination pans and six settlers. Twenty-one new settling tanks are being put in, each tank being five by eight and three feet deep. The ten stamps crush over sixty tons every twenty-four hours."

THE CHRISTY MILL.

"This mill has five stamps, 850 pounds, with a drop of five inches, and making 36 strokes per minute, crushing from 35 to 40 tons of rock every 24 hours. There are six combination pans, 66 inches in diameter, and the charges weigh a little over 3000 pounds. There are three 96-inch settlers, and the mill is well-balanced, as the pans just get away with all the sand the stamps make. This is run by a 45-horse-power engine, on a Corliss bed; the boiler is 54 inches by 15 feet, consuming 4½ cords of pine and cedar every 24 hours. Outside the mill are four large tanks to catch the slum, which is pumped back into the pans in a thick liquid state. What passes out of the tanks is caught in pits capable of holding 15,000 tons. The slum from the rock of this district carries 15 per cent silver more than the ore. This mill, as well as nearly all the mills in the place, uses the double discharge and No. 40 screen.

"The water is taken in pipes 1700 feet to the large tanks outside the mill, and a hydrant, with hose attached, is ever ready in case of fire, and as there is at the mill a pressure of 65 feet, the chances of being burned out are slim indeed.

"The Christy Company's property is under the management of Capt. A. S. Lubbock.

"The following table shows the number of tons of ore crushed and the amount of bullion shipped by the Christy Company for each month in 1878:

1878.	Tons Crushed.	Val. in Bullion.	1878.	Tons Crushed.	Value in Bullion.
January	729	$2,417,993	August	995	$2,495,603
February	738	1,922,570	September	824	2,221,081
March	862	4,646,331	October	880	2,065,118
April	994	2,725,838	November	990	1,571,550
May	967	2,591,600	December	883	1,823,547
June	807	2,693,019			
July	580*	3,085,376	Total	10,249	$302,597,86

* There were 336 tons of slum worked this month.

"In January, 1141 tons of ore were worked, and there was only one day in February that less than forty tons were crushed."

"In the Barbee & Walker mine the incline shaft is down 325 feet on the ledge. The 100-foot level is run north and south on the ledge 225 feet. From the north level the ground is stoped about thirty feet. The total depth of the present workings is 425 feet. The ledge in this mine is never less than three feet thick, while in many places twenty-foot timbers were used in stoping. There are in this mill ten pans and five settlers. The stamps are 750 lbs., with a drop of five inches, and crush, without crowding, six tons to the stamp every twenty-four hours.

"Up to February 15th, there were shipped from this mill 73 bars of bullion, valued at $125,841.26. Over 4000 tons of second-class ore, which had been lying on the dump, are now being worked up, together with some first-class ore from the mine. The object of running this second-class ore through the mill now is on account of its being in the way of the workmen putting up the new hoisting works.

"In the development of this property $4000 were taken over the cost of mining, in sinking the incline and running a few drifts.

"The sampling mills of the Sandy District are rushed night and day with ore from the Little and Big Cottonwoods, Bingham and Butterfield Cañons.

"Messrs. Anderson & Greenhow are reported busy in the forwarding and commission business. They are handling immense quantities of ore from the Yosemite and other mines.

"The Mingo smelter is running two stacks, and if ore could be procured, the four stacks would be employed. They are also erecting a very extensive roaster.

"The Emma is reported as having a nice streak of rich ore.

"The Joab Lawrence Company ships about 250 tons a month, and employs about thirty men.

"The Eclipse mine, situated below the Imperial tunnel in Day's Fork, is now opened up by the fifth level of the Flagstaff. The Eclipse is owned by San Francisco parties who have leased the Flagstaff and Virginia mines and work through the main shaft of the Flagstaff. This property is the most promising in the Cottonwoods, and the shipments average 350 tons per month. The second, third, fourth, and fifth levels of the Flagstaff have been extended through the Virginia, and are about 1500 feet in length, and on the fifth level the developments are good. The present workings of the Eclipse are about 475 feet below the surface. A raise has been started to connect with an incline in Day's Fork. The ore is sent into market and sold to the highest bidder, thus giving all the smelters an equal show to secure fine fluxing ores. About eighty-six men are employed on the mine.

"The Hidden Treasure gives employment to about thirteen men."

PROPOSALS.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received :

Grading and curbing Bergen street, Newark, N. J. ; City Surveyor	March	25,	1879
Cast-Iron Doors and Window Frames, etc. ; John Frazer, Treasury Department, Washington, D. C	"	"	"
Bridge, 90 feet long ; Commissioner of Bedford County, Pa	"	"	"
Erection of Hospital, Lunenberg, N. S. ; F. Braun, Secretary Department of Public Works, Ottawa, Can	"	26,	"
Construction of City Hall Building ; City Clerk, Toledo, O	"	27,	"
Lighting Streets ; G. W. Merrill, City Clerk, Toledo, O	"	"	"
Cast-Iron Water-Pipe ; Timothy T. Sawyer, Chairman Boston Water-Board, Boston, Mass	"	"	"
Beach Gravel required for Paving Department ; Lucius Slade, Chairman Committee on Paving, Boston, Mass	"	"	"
Lehigh Broken Coal, from 1600 to 2000 tons ; S. E. Chamberlain, Warden Massachusetts State Prison, Concord, Mass	"	"	"
Sand Required for Paving Department ; Lucius Slade, Chairman Committee on Paving, Boston, Mass	"	"	"
Coal for Schools of Youngstown Board of Education, Youngstown, O	"	29,	"
Completion of 40 miles of New York & New England RR., from Waterbury, Conn. ; W. Howard White, Chief Engineer, 244 Federal street, Boston, Mass	"	31,	"
Unearthing and Loading on Cars 140,000 cubic yards of Earth and Gravel ; Rudolph Fink, General Manager, Memphis & Little Rock RR., Little Rock, Ark	April	1,	"
Construction of Docks at Lake entrance of the Sturgeon Bay Ship Canal ; Wm. T. Casgrain, Chief Engineer, L. M. S. C. & H. Co., Milwaukee, Wis	"	"	"
Fuel for Pumping Works and Public Buildings ; W. C. McCarthy, Comptroller, Pittsburg, Pa	"	3,	"
Improving Channel at Mouth of Salem Creek, N. J. ; J. N. Macomb, Colonel of Engineers, Philadelphia, Pa	"	3,	"
Stationery and Engineering Materials ; Wm. C. McCarthy, Comptroller, Pittsburg, Pa	"	4,	"
Constructing Fence around Hiland Reservoir ; Wm. C. McCarthy, Comptroller, Pittsburg, Pa	"	"	"
Books and Blanks for Board of Assessors ; Commissioner of City Works, Brooklyn, N. Y	"	9,	"
Coal for Public Buildings ; Western District Commissioner of City Works, Brooklyn	"	"	"
Coal for Public Buildings ; Eastern District Commissioner of City Works, Brooklyn	"	"	"
Wagon Transportation ; Rufus Saxton, Deputy Q.M. General, U.S.A., Fort Leavenworth, Kan	"	15,	"
Designs for Pumping-Machinery, for which premiums will be paid, as follows : 1st best design, $500 ; 2d best, $300 ; 3d best, $200 ; W. E. Cutshaw, City Engineer, Richmond, Va	July	1,	"
Railroad Grading ; P. Bremond, President of the Houston, East & West Texas Railway, Houston, Tex			
Railroad Grading ; 75 miles ; P. Bremond, President of the Houston, East & West Texas Railway, Houston, Tex			
Foreign Contract.—To lay and work up a submarine cable, between Luzon (Philippine Islands) and the coast of China ; Ministerio de Ultramar, Madrid, Spain			
Stoping from 1000 to 3000 tons of Ore per Month, and Sinking a Working Shaft 400 feet deep ; Henry M. Howe, Astor House, New York, from March 31st to April 2d; afterward, at 4 Pemberton Square, Boston, Mass			
Grain Elevators ; Oscar B. Larazin, C.E., Gratz, Austria. Letters can be seen at office of *Engineering News*, New York			
Gas—Supplying the City of Vera Cruz, Mexico, with Gas for a term of five years ; Consul General of Mexico, 35 Broadway, New York			

NEW PATENTS.

The following is a list of the new inventions relating to Iron, Coal, Mining Machinery, Chemical Apparatus, and the treating of Precious Metals, etc., from *The Official Gazette of the United States Patent Office*, for the week ending March 4th, 1879 :

No. of Patent.	*Title of Invention.*	*Name of Inventor.*	*Residence.*
212,792	Electric Signaling Apparatus	Edward N. Dickerson, Jr.	New York, N. Y.
212,829	Quartz-Mill	David H. Anderson (a)	San Francisco, Cal.
212,831	Sucker-Rod Socket for Oil and other Wells	John A. Bair (b).	Parker City, Pa.
212,839	Road-Engine	Fitz E. Culver	Chicago, Ill.
212,851	Electric Light	Philip O. Jenkins	Washington, D. C.
212,855	Collecting Waste-Lead Fumes	George T. Lewis	Philadelphia, Pa.
212,858	Pump	Reuben A. McCanley	Baltimore, Md.
212,860	Electric Light	Cyprien M. Tessié Du Motay	Paris, France.
212,889	Road-Engine	Harry H. Bridenthal, Jr	Latrobe, Pa.
212,902	Mold for Casting Steel	George Cowing	Cleveland, O.
212,907	Amalgamator	Perry Dickson	Spearfish City, Dak.
212,909	Steam-Boiler	George W. Doolittle	Montrose, Pa.
212,943	Apparatus for the Manufacture of Illuminating Gas	Erasm J. Jerzmanowski (c)	New York, N. Y.
212,978	Steam Water-Elevator	Eugene C. Plumer	Columbia, S. C.
212,985	Pump	James W. Robertson	Friend, Neb.
212,959	Hoisting Apparatus	Gelston Sanford	Brooklyn, N. Y.
213,005	Pump	Thomas B. Swan	Mechanic's Falls, Me.
213,018	Surveying Instrument	Henry S. S. Watkins	Woolwich, Eng.
	RE-ISSUE.		
8,607	Flexible Shaft	Nelson Stow (d)	Binghamton, N. Y.

(a) Assignor of half his right to Samuel K. Goldtrap, Centreville, Idaho.
(b) " " " " O. D. Levis, Pittsburg, Pa.
(c) " to Edward Stern, same place.
(d) " Samuel S. White, Philadelphia, Pa.

ASSAY DEPARTMENT FOR THE ENGINEERING AND MINING JOURNAL.

This department is opened for the benefit of miners, prospectors, and others interested in minerals.

Replies will be made in these columns, and *without charge*, to questions asked regarding the nature and commercial value of minerals, and of samples sent.

Assays determining the actual composition and value of ores will be made at the following rates. All assays are made with the utmost care by the most experienced and competent assayers :

Assay for Gold	$2.00	Assay for Copper	$2.00	Assay for zinc	$3.00
" Silver	1.50	" Lead	1.50	Zinc analyses	5.00
" Gold and silver	2.00				

The amount should invariably accompany the order, and expressage or postage must always be prepaid.

Communications, samples, etc., to be addressed to

ENGINEERING AND MINING JOURNAL, 27 Park Place, New York.
(P.O. Box 4404.)

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending March 15th and years from January 1st :

TONS OF 2240 LBS.	1879.		1878.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	62,267	537,641	30,004	506,362
D. L. & W. RR. Co.	63,419	616,122	24,636	388.060
Penn. Coal Co	23,889	198,726	65	88,288
L. V. RR. Co	17,215	162,148	3,177	151,675
P. & N. Y. RR. Co.		4,770	1,590	5,126
C. RR. of N. J	43,330	300,805	536	135,788
	210,120	1,820,212	60,068	1,275,299
Lehigh Region.				
L. V. RR. Co	70,348	432,618	31,025	385,674
C. RR. of N. J	42,742	354,486	7,995	153,582
S. H. & W. B. RR.		4,790	1,444	5427
	113,090	811,894	40,464	544,683
Schuylkill Region.				
P. & R. RR. Co	125,416	1,119,695	485	512,535
Shamokin & Lykens Val	17,470	99,605	7146	80,779
	142,886	1,219,300	7,631	593,314
Sullivan Region.				
Sul. & Erie RR. Co.	985	11,328	255	6,918
Total	467,081	3,892,734	108,418	2,420,214
Increase	358,663	1,442,520		
Decrease				

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

Receipts and shipments of coal at Chicago Ill., for the week ending March 15th, and year from January 1st :

	Week. Tons.	Year. Tons.
Receipts	30,105	360,322
Shipments	7,936	87,795

The increase of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads, amounts to 55,611 tons, as compared with the corresponding period in 1878.

Perth Amboy Business :	Tons.
Received for the week	30,968
Shipped for the week	19,792
On hand March 15th	128,821

The Production of Bituminous Coal for the week ending March 15th was as follows:
Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lb	26,159	185,264
Barclay Region, Pa.		
Barclay R. R., tons of 2,240 lbs	8,761	79,804
Broad Top Region, Pa.		
Huntingdon and Broad Top R. R.	3,535	27,132
*East Broad Top	1,206	10,578
Clearfield Region, Pa.		
*Snow Shoe	471	1,379
*Tyrone and Clearfield	21,028	201,102
Allegheny Region, Pa.		
*Pennsylvania R. R	2,864	26,677
Pittsburg Region, Pa.		
*West Penn R. R	4,292	35,385
*Southwest Penn. R. R	863	5,668
* Penn & Westmoreland gas coal, Pa. R. R	19,521	132,549
*Pennsylvania R. R	7,426	69,583

*For the week ending Feb. 28th.

The Production of Coke for the week ending Feb. 28th :

Tons of 2000 lbs.	Week	Year.
West Penn R. R	2,594	16,745
Southwest Penn. R. R	21,686	163,162
Penn. & Westmoreland Region, Pa. R. R.	1,795	22,886
Pittsburg, Penn. R. R	2,794	27,819
Penn. R R. (Allegheny Region)	1,130	9,336
Total	29,999	229,948

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 21, 1879.

Anthracite.

The coal trade was never in so demoralized a condition as at present, while at the same time it never possessed stronger elements for a good and profitable business. All acknowledge that the present prices are ruinous, and that they can not last ; but yet no one seems to realize what is to be the outcome of the crisis that must soon arrive. There is not the first indication of an arrangement among the companies to control the trade. Nor could any combination be of benefit, as has been abundantly proved again and again in the past five years. In fact, the war is becoming so fierce that the prospects of harmonious accord—not combination—appear to be lessening each day. It is so easy to carry on a war with other people's money.

The actual necessities of the country are so great as to afford a liberal demand ; yet buyers, as a rule, appear to believe that bottom has not been nearly reached, and are holding off as long as possible, thereby throwing the business into the later months of the year, and actually strengthening the position of the producers.

It is impossible to quote prices, as they are very irregular ; but they are in many cases fully 10c. per ton under those realized at the Delaware & Hudson Canal Company's auction sale, and appear to have a further tendency downward. In fact, they are lower now than ever before in the history of the trade. Should an improvement not set in, the financial necessities of the companies may become so great as to force some of them into the hands of receivers, in which case the situation would be even worse than it now is for those that think they are strong.

The Lehigh Valley Railroad Company has made a further reduction of 11c. per ton in tolls, and the Philadelphia & Reading Railroad Company has announced that its tolls from the mines will be only 35 per cent of the selling price at Port Richmond. The Delaware & Hudson Canal Company, and the Delaware, Lackawanna & Western Railroad Company have opened retail yards in Boston, to compete with the Philadelphia & Reading Coal & Iron Company, and it is said that prices have been reduced $1.50 per ton. This has had a very demoralizing effect upon the trade. It is also said that the Reading Company is offering to contract for future delivery at something like current prices.

To those of our readers who can put in supplies for some months ahead, we can say that we believe it quite safe to purchase at the best prices obtainable now ; for if they go much lower, it is hardly probable that they will remain so for any great length of time, and as soon as prices actually touch bottom and take the upward turn, there will be a great rush for coal, especially as it may occur when navigation is open and the whole trade will be in a position to buy.

The Delaware, Lackawanna & Western RR. Co. will sell 100,000 tons at auction next Wednesday. In the present temper of the market, should the sale be a legitimate one, prices must go very low.

The production of anthracite coal last week was 467,081 tons, as compared with 436,409 tons the previous week, and 108,418 tons the corresponding week

in 1878. The total production from January 1st to March 15th was 3,862,734 tons, as compared with 2,420,214 tons for the like period of last year, showing an increase this year of 1,442,520 tons.

Our Philadelphia correspondent, under date of March 20th, says:

"Trade has been kept very dull by the expectation of the spring rates of transportation, which have just been issued. The main features are for shipment from Port Richmond beyond the Capes, 35 per cent of price on board from the breaker; to New York by canal, 45 per cent of price alongside, from Schuylkill Haven, and a lateral toll of 20 cents. Season contracts can be filed with the company until April 30th, at 40 per cent of price on board at Port Richmond, and 50 per cent of price alongside in New York. The rates are low—but barely enough, considering the present low prices, to allow cost to producers. There is a drawback of 30 cents for shipments from Port Richmond to points on the Delaware inside of the Capes. The tolls on pea for shipment beyond the Capes is 70 per cent, which must be a mistake; for, taking the circular prices of the company, it would make the tolls on pea higher than on any other size.

"Vessels are scarce, and rates of freight $1.75@$1.80, according to size, for Boston; $1.50 to the Sound."

Bituminous.

There is said to have been a fairly active business during the past week, in which the Clearfield companies have had the best of the trade. It is now coming to the season of the year when we may anticipate some large contracts; but the very low prices and demoralized condition of the anthracite trade will probably tend to delay business somewhat.

Pittsburg. March 20, 1879.

COAL.—There is a capricious unsteadiness in the action of the miners on the Monongahela, which prevents the revival of the coal trade. Some of them strike, and, in many instances, afterward return to work—then strike again, then go to work again with an instability of purpose that appears likely to end only when the pressure of want compels them to steady labor. But a very small quantity of coal has been sent away during the past week, which has been one of fine navigation. Though empty craft are abundant to receive coal at the mines, it has not been forthcoming; and though nearly all the tugs are in port ready to convoy descending fleets, for the same reason there has been nothing for them to do. It is quite natural to suppose, from this condition of things, that coal would go up in price in the lower markets. And so it would were it not for supplies from the Kanawha and Pomeroy. Pittsburg coal is nearly exhausted at the various places of its consumption, and though superior in quality, the other coals come in and take its place, prevent a rise, and hold the market steady. From the closer situation of the lower coal fields, they can and do control the market, and prevent the fluctuations in prices that used to characterize the trade. The Kanawha region has an advantage of 250 miles less transportation from the mouth of that river, over the coal sent from Pittsburg, and this is what holds coal below fairly remunerative rates at Cincinnati, Louisville, Memphis, New Orleans, etc. For these reasons quotations remain unchanged, and are likely to so remain, indefinitely, unless combinations to effect a rise are entered into by the various upper and lower interests referred to.

PRICES AT PITTSBURG.

Wholesale, on board.....	4	cts. per bushel,	$1.06 per ton
Retail, delivered	5½	" "	1.46 "

AT CINCINNATI.

Wholesale, on board.....	6	cts. per bushel,	$1.59 per ton
Retail, delivered.....	7½	" "	1.99 "

AT LOUISVILLE.

Wholesale, on board.....	6	cts. per bushel,	$1.59 per ton
Retail, delivered.....	7½	" "	1.99 "

AT NEW ORLEANS.

Wholesale, on board.....25		cts. per barrel,	$2.42 per ton
Retail, delivered.....40		" "	3.87 "

Bushels are rated among dealers here at 76 lbs —26½ bushels make a ton, nearly.

The barrel that rules the coal measurement in New Orleans contains 2 4-7 bushels of 80 lbs. each, making about 200 lbs. Nine and two thirds of these barrels weigh a ton, within a small fraction.

COKE.—This large industry moves steadily onward with a regular production and consumption, meeting each other weekly without surplus either in supply or demand—about 30,000 tons weekly is the quantity manufactured and sold. No business so large has more evenly maintained its magnitude and stability. It has submitted to low prices, and will doubtless recover in profitableness, with the restoration of brisk times. We quote as before—$1.15 to $1.30 per ton of 2000 lbs., on board cars at the ovens.—*American Manufacturer.*

San Francisco. March 13, 1879.

COAL.—Imports from January 1st to March 1st: Authracite, 965 tons: Coos Bay, 7205 tons; Vancouver Island, 21,619 tons; Seattle, 21,752 tons; Carmel Bay, 100 tons.

As before stated in these columns, eight cargoes—four of Scotch Splint, and four of West Hartley—have been bought on contract for summer delivery at or about $8 per ton, and at date there are plenty of sellers at same price, but no buyers are over $7.50, and possibly not that. Imports for the week embrace the following cargoes: From Seattle, J. B. Bell, 1150 tons; from British Columbia, Earl Dalhousie, 1400 tons Wellington; Washington Libby, 1400 tons do.; bark Bride, 500 tons do.; Baring Brothers, 3400 tons Nanaimo. The *Alta* says: "The total production of the Monte Diablo mines in January was 9571 tons, making a total of 17,756 tons for the two months, against 14,441 tons for the corresponding time in 1878, and 10,151 tons in 1877. No Eastern or Australian coals have been received this year, against 13,776 tons of the former, and 8145 tons of the latter, in the first two months of 1878. There is no Wallsend, West Hartley, or Scotch in first hands, though two cargoes of the first named are now on the way. There is a sharp rivalry among the receivers of Coos Bay Coal, the products of the Eastport and Newport mines selling from $7@$7.50 per ton, while that of the Southport port has been recently reduced from $7 to $6 per ton. The sales of Empire (Monte Diablo) coal during the past month were over 2400 tons."—*Commercial Herald.*

New York.

Wholesale Prices of Anthracite Coal Delivery f. o. b. at Tide Water Shipping Ports, per ton of 2240 lbs.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
WYOMING COAL.	$	$	$	$	$	$
Lackawana, at Weehawken	.....	.....	.....	.....	.....	.....
*Pittston, at Weehawken	.....	2 30	2 30	2 30	2 65	2 35
L. Val. Coal Co., at Amboy	.....	.....	.....	.....	.....	.....
Honey Brook Lehigh	3 00	.....	2 80	2 80	2 80	2 60
Wilkes-Barre at Pt. Johnson	2 40	2 40	2 45	2 45	2 80	2 60
Plymouth Red Ash at Port Johnson	.....	.....	2 45	2 50	3 10	2 70
LEHIGH COAL.						
†Spring Mount. Lehigh, at P. Amboy	3 25	3 00	2 85	2 85	2 85	2 75
Cross Creek, at Port John.	3 00	2 75	2 75	2 75	2 75	2 70
†Buck Mount. Vein at Elizabeth Port or S. A.	3 00	3 00	2 75	2 75	2 85	2 75
Fulton	3 40	.....	3 00	3 00	2 85	2 75
SCHUYLKILL COAL. *At Port Richmond, Phila.*						
Har l White Ash Coal	2 75	2 75	2 50	2 50	2 50	2 25
Free-Burning White Ash Coal	.....	2 50	2 27	2 25	2 50	2 25
North Franklin White Ash Coal	.....	.....	2 25	2 25	2 50	2 25
Schuylkill Red Ash Coal	.....	.....	.....	2 50	2 65	2 25
Shamokin Coal	.....	.....	.....	2 50	2 65	2 25
Lorberry Coal	.....	.....	2 75	2 75	3 00	3 00
Lykens Valley Vein Coal (Brookside)	.....	.....	3 50	3 50	3 50	3 50
‡*Alongside at N.Y. Harbor.*						
Hard White Ash Coal	3 25	3 25	3 00	3 00	3 00	2 75
Free-Burning White Ash Coal	2 75	2 75	2 60	2 60	3 00	2 75
Schuylkill Red Ash Coal	.....	.....	.....	2 75	3 25	2 75
Lorberry Coal	.....	.....	.....	3 25	3 50	3 00
Lykens Valley Vein Coal	.....	.....	.....	3 75	4 00	3 75

* Forty cents per ton additional for delivery in New York.

† These prices are given by Whitney, McCreary & Kemmerer.

‡ On coal delivered f. o. b., at shipping wharf at Williamsburg, the current rate of harbor freight will be allowed from above prices.

Wholesale Prices of Bituminous Coal.

MANUFACTURING AND STEAM COALS.

Cumberland at Georgetown and Alexandria	2.75@2.90	4.35@4.50
Cumberland, at Baltimore	2.90@3.00	4.35@4.50
Cl'rf'd "Eureka" and "Franklin."		
At mines	0.75	....
At Baltimore	3.25	4.50
At Philadelphia	3.25	4.50

DOMESTIC GAS COALS.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside at New York.
Westmoreland and Penn	$4.25	.....
At Greenwich, Philadelphia	.....	$5.50
At S. Amboy	5.00	5 50
Kanawha at Richmond	4.10	5.40
Red Bank Cannel, Pa., at Philadelphia	8.00	8.50
Youghiogheny, Waverly Co., at Balt	4.00	5.65
Despard, West Va	4.50	6 00
Murphy Run, West Va., at Baltimore	3.75	5.85
Fairmount, West Va., " "	3 75	5.70
Newburg Orrel. Md. " "	3.75	6.00
Cannelton Cannel, West Va	....	10.00
" Splint " at Richmond.	6.00	7.00
" Gas Coal at Richmond	4.00	5.65
Peytona Cannel, W. Va., at Richmond	....	10.00

Retail Prices.

Per ton of 2000 lbs.
Anthracite.

	G. & Egg.	Stove.	Chest.
Pittston coal delivered	$3.75	$4.00	$3.75
Lack. coal, delivered below 59th St.	3.75	4.00	3 75

FREIGHTS.

Ocean Freights.

Ocean Freights on coal, iron, etc., per ton of 2000 lbs. to and from foreign and domestic ports, for four weeks ending March 20th, 1879, are given below.

DATE.	From	To	Cargo.	R'te
Feb. 21	Baltimore	Baracoa	Coal	2.00
" 21	Ashley River, S. C.	Baltimore	†	2.15
" 21	New York	Savannah	Guano.	2 00
" 21	New York	Philadelphia	Salt	3.50
" 21	New York	Richmond	*	1.00
" 21	New York	Richmond	‡	1.00
" 22	Ashley River	Wilmi'gt'n, Del.	*	2.25
" 25	Barren Island	Savannah	†	2.00
" 25	Linden, N. J.	Savannah	†	§
" 28	Weymouth	Wil'ngt'n, N. C.	*	1.25
" 28	Boston	Newark, N. J.	Bones	1.25
" 28	Barren Island	Savannah	*	2.00
" 28	New York	Charleston	Guano.	2.00
" 28	Charleston	Baltimore	†	2.00
Mch. 4	Boston	San Francisco	Iron	**
" 4	Savannah	Philadelphia	Old iron	2.65
" 4	New York	Port Royal	¶	2.00
" 4	New York	Richmond	Pig-iron	††
" 7	South Amboy	New Orleans	RR. iron	3.25
" 7	New York	Charleston	‡‡	....
" 7	Perth Amboy	Boston	Pig-iron	1.90
" 11	Cadiz	Boston	Salt	7¼c
" 11	New York	Wil'ngt'n, Del.	Pig-iron	1.00
" 18	New York	Wash'gt'n, D.C.	*	1.60
" 18	Elizabethport	Baltimore	Pig-iron	90
" 18	Hoboken	Portland	Pig-iron	1.70
" 20	Philadelphia	Cardenas	Coal	1.10
" 20	Philadelphia	Matanzas	Coal	1.10
" 20	South Amboy	Havana	Coal	1.00
" 20	Perth Amboy	Portland	Pig-iron	1.60

* Phosphates. † Phosphate rock. ‡ Old rails. § $2 and towing. ‖ Peruvian guano. ¶ Phosphates and railroad iron. ** $8@$10. †† 90c.@$1. ‡‡ Fertilizers and sulphur.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to March 21st, 1879.

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Alexandria	1.30	.....	.....
Allyn's Point	.....	.....	.....
Annapolis	1.05	.....	.....
Baltimore	60½@62	.....	.....
Bangor	.....	1.80	.....
Bath, Me	.....	1.75	.....
Boston, Mass	¶	1.75	1.25
Braintree	.....	.....	.....
Bridgeport, Conn.	.....	1.50	.....
Brooklyn	.....	.....	.....
Cambridge, Mass.	.....	.....	.....
Charleston	1.50	.....	.....
Charlestown	.....	.....	.....
Cambridgeport	1.85	.....	.....
Danversport	1.95	.....	.....
Danville, Va	1.10	.....	.....
East Cambridge	.....	.....	.....
Fall River	1.50	1.50	90
Fortress Monroe	.....	.....	75
Galveston	.....	.....	.....
Georgetown	1.00	.....	.....
Gloucester	1.80	.....	.....
Hackensack	.....	.....	.....
Hartford	.....	1.50	.....
Hoboken	.....	.....	.....
Hunter's Point	.....	.....	.....
Jacksonville	.....	.....	1.50
Jersey City	.....	.....	.....
Lynn	1.97½	.....	.....
Marblehead	.....	.....	.....
Medford	1.90	.....	.....
Middletown	.....	.....	.....
Newbern	1.20	.....	.....
New Bedford	.....	1.50	1.00
Newburyport	1.75	1.85	.....
New Haven	85@95	1.50	.....
New London	.....	1.50	.....
Newport	.....	.....	.....
New York	85	1.50	.....
Newark	.....	.....	.....
Norfolk, Va	75	.....	75
Norwich	.....	1.60	.....
Norwalk, Conn	.....	1.60	.....
Pawtucket	.....	1.80	.....
Petersburg	1.25	.....	1.10
Philadelphia	.....	.....	.....
Port Eades	.....	.....	.....
Port Royal	.....	.....	.....
Portland	.....	1.75	1.00†@1.25
Portsmouth, Va	1.00	.....	.....
Portsmouth, N.H.	.....	1.85	.....
Providence	1.50	1.60	90
Provincetown	2.00	.....	.....
Richmond, Va	90@1.10	.....	85
Rockland	.....	.....	1.65
Rockport, Mass.	.....	.....	.....
Sag Harbor	.....	.....	.....
Salem, Mass	.....	1.80	.....
Savannah	1.60	.....	.....
Somerset	1.50	.....	.....
St. John, N. B.	.....	.....	1.00
Wareham	.....	1.80	.....
Washington	1.00@1.05	.....	.....
W'lmington, Del.	.....	.....	.....

* And discharging and towing. † And discharging. ‡ And towing. § 3 cents per bridge extra. ‖ Alongside. ¶ 1.75 @1.80§@1.90.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 21, 1879.

American Pig.—There has been a fair business the past week, yet it has been quiet as compared with previous weeks. Prices are being advanced, which has a tendency to keep buyers out of the market. The outlook for the makers is very encouraging, especially under the low price of coal. We quote No. 1 Foundry at $18@$19; No. 2, $16.50@$17.50; and Forge, $15.50@$16.

Scotch Pig.—The arrivals during the week have been 200 tons of Coltness, and 200 tons of Glengarnock, which had been sold previously on private terms. Prices are advancing in Scotland, and freights are also higher, yet there has been no change in this market. We quote Eglinton at $20; Coltness, $22; and Glengarnock, $20.50@$21.

Messrs. William Colvin & Co., of Glasgow, under date of March 4th, say of the iron market:

"We have this week to report a continuation of the improvement in the value of pig-iron. There has been a slightly better demand for shipment, but the firmer tone of the market seems principally caused by the conviction gaining ground that prices have been at a lower level than ever present adverse circumstances warrant. The Warrant Market opened firmly on Wednesday, and an extensive business was done from 44s. 1½d. to 43s. 10½d. cash, closing on Friday with buyers at 44s. On Monday there was more eagerness shown to buy, and numerous purchases were made from 44s. 3d. to 44s. 6d. cash, and 44s. 6d. to 44s. 8d. one month, but during the afternoon there was a reaction, and the closing price was 44s. 2d. cash. To-day the market opened at 44s. 1d. cash, and 44s. 3d. one month, and advanced to 44s. 3d. cash, and 44s. 6d. one month, a good deal being done at the higher prices; during the afternoon, the tone again became flat, with business down to 44s. 3d. one month, and 44s. 1½d. cash, at which sellers remained. There is a slightly better feeling in makers' iron, and advances from 6d. to 1s. per ton are obtainable on the various brands. The Middlesbrough market is stronger, and a decided advance has taken place since last week. No. 3 quoted 35s. to 35s. 6d."

Rails.—We learn of no business, although there are important negotiations under way. We quote steel rails at mill at $43@$44 and iron rails at $36@$37 here.

Old Rails.—A sale of 500 tons at $21 is reported.

Wrought Scrap is scarce and quoted at $23@$24.

Our Baltimore correspondent writes, March 17th:

"The demand for pig-iron continues fair, and prices about the same."

The following is from Pittsburg, dated March 18th:

"The market remains quiet and steady, and while there is no great accumulation of stock, there is still a plentiful supply of all the grades wanted, and, consequently, little indication of any speedy advance in prices."

Our Columbus (O.) correspondence of the same date is as follows:

"The past week has developed nothing of special importance in the pig-iron market. The demand has been good and prices well maintained at last quotations."

Louisville advices (March 18th) are as follows:

"The market is very firm for all grades. Some furnaces have sold so far ahead that they have withdrawn from the market, and a further advance is anticipated. Prices are unchanged."

At Cincinnati, prices are about the same.

Philadelphia. March 20, 1879.

[Specially reported by JUSTICE COX, JR., & Co., Iron Merchants, 333 Walnut street, Philadelphia.]

Pig Iron.—The demand for pig holds and prices continue to stiffen. We hear of one producer refusing to name prices, having sold all he can deliver for April, and hopes to get an advance in May. We quote: No. 1, $18.50 to $20; No. 2, $16 to $18; Gray Forge, $16 to $17.50.

Manufactured Iron.—The demand for bars is very good at the advance of two dollars per ton, most mills in this neighborhood having about all they can do, refusing orders at any thing but full prices and full extras. We quote prices firm at 1 8-10 to 2c. The plate mills are filling up, but not yet so busy as the bar mills. Plates may be quoted firm at fully one dollar per ton advance. We quote 2 2-10 to 6½c. per lb. Skelp is in good demand, but at such low prices that few but the most favorably-located mills care to accept orders. We quote 1 9-10 to 2-10.

Muck Bars.—The demand for muck bars is very good. Mills that have been supplying the market from their over stock now have all they can do to keep their own finishing rolls supplied with stock, and an advance is reported of about two dollars per ton. We quote $32 to $34, Philadelphia.

Rails.—The steel rail mills have all they can do, and refuse orders for any but first-class roads, and at full prices. The iron rail mills report a steadily increasing business and advancing prices. We quote: steel, $42 to $44; iron, $34 to $36, at mill.

Old Rails.—The demand for spot lots continues good, and fully $2 above prices offered for future delivery: $22 for spot lots is freely offered, while $20.50 to $21.50 is full price for April and May delivery. We report sales of 500 tons, at $22, spot, and quote $21@$22.

Scrap.—Wrought is in fair demand, at $20@$22; cast dull, at $12@$16, all at Philadelphia.

METALS.

NEW YORK, Friday Evening, March 21, 1879.

The week under review has been an active one in the metal trade, although all articles have not participated largely in the business.

RECEIPTS OF METALS AT NEW YORK FOR THE ELEVEN WEEKS ENDING MARCH 20TH AND YEAR FROM JANUARY 1ST, 1879.

	Feb. 27	Mar. 6	Mar. 13	Mar. 20	Year from Jan. 1.
Copper, bbls	57	31	18	32	1,331
Copper, boxes	.....	.....	.....	.....	.....
Copper, cakes	807	91	321	.....	2,828
Lead, pigs	2,409	5,263	4,671	11,669	43,154
Spelter, pieces	865	2,060	7,525	4,523	32,638
Quicksilver, flasks	.....	.....	.....	.....	.....

Copper.—This article is very quiet and is quoted nominally at 16c., although business has been done at less.

Our advices are as follows from London under date of March 4th:

"Telegrams are in from Chili advising charters for the last half of February, amounting to 1100 tons pure, of which 600 tons bars for England, 500 tons bars for France.

	1879. Tons.	1878. Tons.	1877. Tons.	1876. Tons.
Charters Jan. 1st to Feb. 28th	7,600	8,558	8,902	6,346
February, only	3,400	4,378	4,012	2,803

Prices of bars at Valparaiso had fallen to $13.60, which with exchange at 38¼d, steamer freight, 60s., equals £53¾ Liverpool, without merchants' commission."

Under date of 7th, we have received the following:

"The only sale reported to-day in Chili bars was one of 25 tons, best brand, at £56, cash. Common marks are nominally, £54¾; good ordinary brands, £55; favorite sorts, £55¼; but scarcely any thing offering for sale. It is therefore difficult to say at what figures any important quantity of metal could be purchased, as owners seem quite determined to withhold the bulk of their stocks from the market, while values rule at so low a level; and it is rather doubtful if a large purchase of stuff could be made, even by offering to pay a good premium on current rates. Wallaroo Cake is quoted £63½@£64, and Burra, £62½@£63, with no transactions in either. English Copper is steady. Best Select is £60½@£61½, according to brand. Tough Cake rules at £59@£60; Sheets are dull, and values rather nominal; India, 4 × 4, £64; other sheets; £65."

Tin.—This has been the most active metal on the list; the sales and resales amounting to fully 1000 tons. On the 15th inst. the London price was cabled at £66, afterward at £68, and on Wednesday at £69. On Thursday £68 10s. was advised, and to-day £66 10s. Singapore was quoted by last cable advices at $21.40. Early in the week advices came that the shipments from the Straits for the first half of March were nil. This, in connection with the advance in London, brought about quite a speculation here, and about 150 tons were sold on spot at 15@15½c.; 175 tons January shipments at 15@15⅝; 125 tons of February shipments at 14⅞@15⅛c., and 150 tons of Billiton on p. t. For a short time the nominal price, on spot, was 16c. In addition to the above business, the leading operator in this market sold, to a very strong Boston house, on private terms, all of his spot tin and January and February shipments due him. Telegrams have since come, stating that the shipments from the Straits were, according to one, 500 tons the first half of the month, and, according to another, 560 tons. The position of the market is really a stronger one than it has been, yet prices are weaker. Straits, on spot, is quoted at 15½c.; for February shipments, 15c.; and January shipments, 15⅝@15¼c. L. & F. and Refined are without business, the former being quoted at 15¼c., and the latter at 15½c.

Under date of the 7th, we have received the following:

"A slight tendency to advance, and we note a few sales at 63@63¼s. The Dutch Trading Company has declared 23,300 slabs Banca for sale on 23d inst."

Statistics of Foreign Tin in London and Holland.

		Stocks. Feb. 28th. Tons.	Stocks. Jan. 31st. Tons.	
Australian and Straits		9,696	9,523	London.
Banca (*ex* sale)		1,704	1,966	
Billiton		2,236	2,106	Holland.
Australian		320	341	
Total		13,956	13,936	
Approximate quantity afloat	Australian	1,600	1,970	
	Straits	1,150	1,200	
	Billiton	1,250	1,000	
Total		17,956	18,106	

Tin Plates are dull and unchanged. There is a better jobbing business. We quote, per box, as follows: Charcoal, bright, IC X, Melyn grade, $6.25, and Allaway grade, $6.12½; Charcoal ternes, Allaway grade, $5.75; coke, bright, B. V. grade, $5.30@$5.37½, and coke roofing, 14×20, $5.

Messrs. Robert Crooks & Co., of Liverpool, under date of March 6th, say of tin and terne plates:

"There has been little alteration this past month in quotations. In spite of want of support at the higher figures from the United States, most of the larger buyers continue to show their confidence in the market by operating freely. With the exception of coke tins, which speculators are showing some disposition to re-sell, we have to report a firm market, and more especially for charcoal tin and terne."

Lead.—Late last Friday, 150 tons were sold at 3½c. Early this week, some corroding lead sold at 3¼c., after which 340 tons of Richmond lead sold from dock and store at 3·10c. Of this lot about 100 tons were for shipment to China. Since then there have been sales of 200 tons at 3·20c., and the market closes at 3½c. The London price is cabled at £14 15s. for good soft lead.

The shipments of lead to China for the first two months of this year were 775 tons, as compared with 1410 tons in 1878; and to Japan 79 tons, as compared with 572 tons in 1878.

Spelter and Zinc.—We learn of no business of importance in either. The market for the former is 4⅝@4¾c., and for the latter 6@6¼c.

In our issue of March 15th, we quoted "Bergen Port spelter from New Jersey ores at 9c." It should have read, "Bergen Port spelter from *Lehigh ores* at 9c." The Bergen Port Zinc Company has never used a pound of any thing but Lehigh Valley ore for spelter.

Antimony.—This article is very quiet, and quoted at 11⅝@12c., according to brand.

Quicksilver.—The San Francisco *Commercial Herald* of March 13th says: "There was a sale made last week of 800 flasks for export at 36c. This is the lowest price yet reached, but at date 37@37½c. is the ruling rate. Receipts for the week, 675 flasks."

THE BULLION MARKET.

NEW YORK, Friday Evening, March 21, 1879.

The present week's record of the silver market, abroad and at home, is but a continuation of the preceding reports of weakness and declining tendency. Stocks are augmenting in London, on the Continent, and in San Francisco, with no demand equal to the regular production of this country alone, to take no account of other silver-producing countries, such as Mexico and the South American States. Unless, therefore, our own government should soon enter the market for at least the minimum amount directed to be purchased for the coinage of standard dollars, or a demand from some other quarter should arise, the course of the silver market must be expected to continue in the direction of lower figures.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
Mar. 15	49⅜	107⅝	Mar. 19.	49⅛@48¾	†
Mar. 17	49¼	107½	Mar. 20.	48⅞@49	106¾
Mar. 18	49⅛	*	Mar. 21.	48⅞	106½

* 107¼@107. † 107@106½.

BULLION SHIPMENTS.

We give below a statement showing the latest bullion shipments in addition to those announced in our issue of March 15th:

March 5th	Tybo Con	Nev	$3,975.29
" 5th	Northern Belle	"	6,196.99
" 5th	Caledonia	"	5,500.00
" 8th	Martin White	"	18,725.29
" 9th	Paradise Valley	"	2,843.25
" 8th	Highbridge	"	4,141.00
" 9th	Alexander	"	6,900.00
" 10th	Independence	"	6,800.00
" 10th	Grand Prize	"	12,500.00
" 10th	Richmond	"	13,826.89
" 11th	Hillside	"	4,740.00
" 11th	Con. Virginia	"	53,171.49
" 11th	Ophir	"	15,786.10
" 7th	Star	Cal.	4,800.00
" 8th	Bodie	"	6,275.01
" 8th	Standard	"	19,529.91
" 10th	Leeds	Utah	3,712.00
" 11th	Stormont	"	7,101.96
" 11th	Christy	"	5,463.00
" 13th	Silver Reef	"	9,119.97
" 13th	McCormick & Co.	"	35,460.00
" 6th	Tip Top	Ariz.	25,700.00

$240,000 in gold dust was recently shipped from the Black Hills, Dak.

The February product of the California mine was $165,891, and of the Ophir mine $165,000.

FINANCIAL.

Coal Stocks.

NEW YORK, Friday Evening, March 21, 1879.

The business in these stocks in this market the past week has been only moderate, and prices have followed the downward course of the price of coal. The dealings in Delaware & Hudson Canal have amounted to 3155 shares, at 41@39¼, closing at 39¾. Delaware, Lackawanna & Western records sales of 105,470 shares, at 47⅛@45¼, closing at 45⅛. The dealings in New Jersey Central have amounted to 54,220 shares, at 39¼@36½, closing at 37¼.

The Philadelphia market has been very quiet, with a weakening tendency. Lehigh Coal & Navigation has sold to the extent of 1968 shares, at $15⅝@$14⅞; Lehigh Valley Railroad, 1390, at 35½@34¼; Pennsylvania Railroad, 24,872, at $35@34½, and Philadelphia & Reading, 4676, at $12⅛@$12½.

Gas Stocks.

NEW YORK, Friday Evening, March 21, 1879.

The market is dull; very little doing, with prices a little in favor of buyers. We lower the quotations of the following companies: Brooklyn Gas, from 150 asked to 140; Metropolitan, Brooklyn, from 60 bid to 54; Citizens', from 75 to 70 bid; and Municipal, from 115 to 110 bid. The remainder of the list remains the same as last week.

Rumors are again current, in well-informed quarters, that Mr. Edison has recently met with great success in his experiments with the electric light, and also that his most sanguine expectations as regards its value for lighting purposes are realized.

The Naphtha vs. Gas Question in Brooklyn.—The saving of $90,000 per year, which it is claimed will be made by the use of naphtha in place of gas, has met a vigorous protest on the part of the New York Board of Fire Underwriters, a communication from the Secretary of said Board to the Mayor of Brooklyn, under date of the 19th inst. says that "in the judgment of this Board, the lighting of the streets of Brooklyn with naphtha would be dangerous to life and property. * *" The following table shows the amount of the yearly appropriations for lighting Brooklyn since 1859:

Year.	Amount.	Year.	Amount.
1859	$101,500	1870	$450,000
1860	101,500	1871	550,000
1861	122,500	1872	550,000
1862	125,000	1873	550,000
1863	136,000	1874	600,000
1864	125,000	1874 (deficiency)	172,065
1865	150,000	1875	575,000
1866	175,000	1876	500,000
1867	325,000	1877	422,600
1868	370,000	1878	430,000
1869	400,000	1879	351,200
Total			$7,282,365

There are 14,126 lamps in use in the city. At $19.85 a

lamp, which is the contract rate with the Naphtha Co., the total cost will be $280,778, while the cost at the lowest price named by any of the gas companies is $353,625.

It is believed that the Mayor will veto the action of the Board of Aldermen, and as the vote originally stood 13 to 10 it, is thought that the change will not pass over the Mayor's veto.

The Hartford Gas Co. has reduced the price of gas to $2 per 1000.

The Citizens' Gas-Light Co., of Warsaw, has reduced the price of gas to $3 per 1000.

The Excelsior Coke and Gas Co., of Topeka (Kan.) has reduced the price of gas from $4 to $3 per 1000 feet.

The second annual meeting of the Oil-Gas Association will be held at Middletown, O., May 14th.

The Quebec Gas Co. held its yearly meeting on the 4th inst. The receipts of the company for the year from gas rentals was $80,918. Expenditures included $13,500 for coal, $24,000 for dividends, and $14,195 for discounts to consumers. A good many of the company's consumers have taken to using coal-oil instead of gas.

AUCTION SALES:

Metropolitan Gas Co., of Brooklyn.—15 shares, at 54½.
Metropolitan (N. Y.) Gas Co.—100 shares, at 125½.
Municipal (N. Y.) Gas Co.—A special meeting of the stockholders of this company is called for April 7th, to increase the capital stock from $1,500,000 to $2,000,000.

AUCTION SALES:

Delaware & Hudson Canal Co.—$3000 of the first-mortgage 7 per cent registered bonds, at 97 per cent.
Shenandoah Valley RR. Co.—$250,000 first-mortgage loan, at 50 per cent; 5000 shares do. do., at 10 per cent.
Lehigh Navigation Co.—$8000 6s, of 1884, at 104 per cent; $5000 do. do., Deb. 6s, at 70 per cent.
Reading RR. Co.—$7000 Cons. 7s, at 103½ per cent.
Sunbury, Hazleton & Wilkes-Barre RR. Co.—$300 first-mortgage 5s, at 84 per cent.
Chesapeake & Delaware Canal Co.—$1000 6s, at 75¾ per cent.
The Mount Farm Coal & Oil Co., has declared a quarterly dividend of 2 per cent, payable on demand.
The United Companies of New Jersey announce a dividend of 2½ per cent, payable April 10th.
The Gutta Percha & Rubber Mfg. Co. will hold its annual meeting April 2d.
St. Mary's Canal Mineral Land Co.—The annual meeting of this company will be held March 27th.

The following list of Companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York:

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS. Rate per ann.	Am. of last.	Date of last.	QUOTATIONS Bid.	As'd.
	$		P. ct.				
Mutual, N. Y.	5,000,000	$100	6	1½	Jan., '79	72½	76
" Bonds	90,000	1,000	6	3½	Feb., '79	98	100
N. York "	4,000,000	.....	8	4	Nov, '78	100	105
Metrop. "	2,500,000	100	10	5	Feb., '79	115	125
" Certfs.	1,000,000	.....	7	3½	Feb., '79	98	102
Harlem "	1,850,000	50	6	3	Feb., '78	35	45
Manhat. "	4,000,000	50	....‡	5	Feb., '79	180	190
Brooklyn, Bkln.	2,000,000	50	15	5	Jan., '79	140	145
Nassau	1,000,000	25	....‡	3	Jan., '79	75	80
" Certfs.	700,000	1,000	7	3½	Nov. '78	95	100
People's	1,000,000	10	....‡	3½	Jan., '76	26	30
" Certfs.	300,000	1,000	7	3½	Jan., '79	75	80
" Bonds	325,000	.....	7	3½	May, '78	90	96½
Metrop. "	1,000,000	100	5	2½	Nov., '78	54	60
W'msb'g "	1,000,000	50	8	1½	Jan., '79	81	90
" Certfs.	1,000,000	.....	7	3½	Jan., '79	85	95
Citizens'	1,200,000	20	....‡	3	Jan., '79	70	80
" Certfs.	320,000	1,000	7	3½	Oct., '78	90	100
J. C., N. J	750,000	20	10	7½	Jan., '79	145	155
Municipal, N. Y.	466,000	50	.....	.....	.....	110	120
" Bonds	750,000	.....	.....	.....	.....	95	....
.....	.....	.....	.....	.....	.....	.....	.....

Miscellaneous Stocks and Quotations.

Sales and quotations of the stocks and bonds dealt in here, at Philadelphia and Baltimore, for the week ending the 20th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.	Par Value.	High'st	Lowest	Closing	Sales: Shares.
American Coal Co.	$25	.....	.....	30	.....
St. L., I. M. & S. R. Co.	100	.....	.....	15	.....
Spring Mt. Coal Co.	50	.....	.....	50	.....
*Cambria Iron Co.	50	.....	.....	64	.....
*Penn. Salt Mf'g Co.	50	.....	.....	74½	2
*Westm'land C. Co.	50	.....	.....	53	.....
*Buck Mt. Coal Co.	50	.....	.....	35	.....
*Schuyl. Nav. Co.	50	.....	.....	....	.....
†B. & O. RR. Co. 1st pf	.....	.....	.....	103	.....
†B. & O. RR. Co. 2d pf	100	.....	.....	98	.....
" " " com	90	.....	.....	94	.....
†George's C'k C. Co	100	.....	.....	55	.....
†S. Clara M'g Co.	100	.....	.....	25	.....
†Atlantic Coal Co.	10	.....	.....	90	.....

BONDS.	Princ'l. When Due.	Int'est. When Due.	Hig'st.	Lowest	Amount.
D., L. & W., 7s, conv	1891	J. & D.	104	.....	$1,000
" " " 2d mtge.	1882	M. & S.	104	.....	10,000
N. J. C., 1st mtge. new	1890	F. & A.	116	.....	2,000
" " " 1st mtge., con	1899	Q.	85⅝	83½	*188,000
" " " convt.	1902	M. & N.	85⅞	83	*23,000
Lehigh & W. B., con	1899	Q.	75	74¾	†9,000
Am. Dock & Imp. 7s	.....	J. & J.	63½	.....	1,000
St. L. I. M. & S., 1st mt	1892	F. & A.	110¼	110	4,000
Ches. & O., 1st mtge	1899	M. & N.	.....	.....	.....
D. & H. C. Co., 1st m. rg	1884	J. & J.	98½	.....	1,000
" " " " "	1891	J. & J.	98½	98⅜	11,000
" " " " m. loan cp	1894	A. & O.	101½	101	27,300
" " " " " rg.	1894	A. & O.	101	.....	5,000
" " " " new mge.	.....	.....	.....	.....	.....
*L. V. R., 1st m. 6s. cp.	1898	J. & D.	112	.....	3,000
" " " " rg.	1898	J. & D.	112	111¾	13,000
" " " 2d m. 7s, rg.	1910	M. & S.	117	.....	7,000
" " " con. m. 6s, rg	1823	J. & D.	102	.....	10,000
" " " 6s cp.	1923	J. & D.	.....	101½	.....
*Pa. RR., 1st m. 6s, cp	1880	J. & J.	104¼	.....	12,000
" " g. m., 6s, cp.	1910	J. & J.	111¼	.....	8,000
" " " 6s, rg.	1910	A. & O.	.....	114	.....
" " con. m. 6s, rg.	1905	Q.	.....	103	.....
" " " 6s, cp.	1905	J. & D.	102	.....	7,000
" " new loan, 5s	.....	.....	113	.....	2,500
*P. & R. R., 1st m. 6s, R. C. 43-44	1880	J. & J.	.....	.....	.....
P. & R. R., 1st m. 6s, R. C. 48-49	1880	J. & J	.....	.....	.....
P. & R. R., 2d m. 7s cp	1893	A. & O.	.....	115	.....
" " " scrip	1882	J. & J.	49¾	49¼	1,500
" " " in. m. 7s, cp	1896	J. & D.	48½	.....	3,000
" " " c. m. 7s, cp.	1911	J. & D.	104	103½	11,000
" " " " 7s. rg.	1911	J. & D.	104	.....	3,000
" " " cvt. 7s, R. C	1893	J. & J.	.....	.....	.....
" " C. & I. Co., Deb 7s, R. C.	1892	M. & S.	.....	.....	.....
& R. C. & I. Co., m. 7s, R. C.	'92-3	various	.....	.....	.....
*L. Nav. Co., 6s, rg. m.	1884	J. & Q.	104½	.....	4,500
" " RR., rg. m.	1897	F. & Q.	.....	.....	.....
" " cvt. co. G. R.	1894	M. & S.	.....	.....	.....
" " " Gold R. C.	1897	J. & D.	93½	.....	6,500
" " con. m. 7s, rg.	1911	J. & D.	.....	65	.....
*P. & N. Y. C., 7s, R. C.	1896 / 1906	J. & D.	.....	115	.....
*Pa Canal, 6s, cp.	1910	J. & J.	.....	64	.....
*Schuyl. Nav., 1st m. 6s. rg	1897	M. & Q.	.....	88	.....
*Sus. Coal, 6s, rg	1911	J. & J.	.....	.....	.....
†Balt. & O. RR., 6s	1880	J. & J.	.....	.....	.....
" " " " 6s	1885	A. & O.	.....	.....	.....

Total transactions for the week..... $372,000

* Assented. † $1,000 selling at 52.

Gold and Silver Stocks.

NEW YORK, Friday Evening, March 21, 1879.

The increase of interest in mining investments from week to week is rapid, though not of regular dimensions. Fortunately, the present interest is better protected than any previous one, and such losses as have been made were the result of gross negligence on the part of investors in not taking reasonable business precautions. Such losses have in the aggregate been small, but yet they have shown the precautions necessary to safe investment. The vast amount of attention devoted to mining by the press during the past two years has given the public a greater knowledge of this industry than it ever had before, and with the telegraph and the united staffs of the press, it is likely to be kept well informed upon all of our leading mines.

The large number of really good mines that are already in this market, and others that are to come, are taking the attention from the speculative and non-productive mines of the San Francisco market, and the great success attained by some of them has attracted the attention of many of our conservative capitalists, so that these stocks are being largely taken for permanent investment. It is not strange that mining stocks should become popular when we consider that there are millions of dollars invested in this city in railroad and other "securities" which, when they pay at all, do not make nearly as good returns as many of our dividend-paying mines; while many other stocks which are selling at high prices and not paying dividends have not, as a rule, as good prospects of profit as the majority of our non-dividend-paying mines. There are many millions of dollars invested in the coal properties of Pennsylvania, with no prospects of dividends for a long time, and, when they do come, but very moderate ones. Our prominent, well-developed gold and silver mines, though subject to more "accidents" and variations in richness than our coal mines, possess at least the advantage of a more marketable product, and the risks of "accidents" in the veins may be measurably overcome by prudent management in keeping constantly large reserves. At the same time, gold and silver mines now offer much larger prospective profits than do coal mines.

The mere fact of companies having offices in the East, and representatives enjoying the confidence of the public, is doing much to strengthen the interest.

The San Francisco market is too far away to suit the Eastern speculator or investor. A mine may be in the most promising condition, and a clique in San Francisco may by some means create quotations for the press dispatches, and, owing to the inability of the public to learn the cause of the decline, cause stock to be forced upon the market at considerable loss. It is, therefore, but reasonable to suppose that, as our lists of mining stocks increase, the dealings will be mostly confined to this market, where, if a decline takes place, the cause can be immediately learned, and the holder of stock can exercise his own judgment in the matter of holding or selling. The Eastern public also has, we think very justly, an objection to assessable stocks, an objection which can only be overcome by the high personal reputations of those who offer such stocks for sale; while many of the well-known San Francisco stocks are under the control of parties who do not command—and in some cases do not deserve—the confidence of the public. We shall therefore probably find the interest in Comstocks, Tuscaroras, and others of that class lessening rather than increasing, as the interest in mining investments deepens and widens here in the East.

The San Francisco methods of mine management will, we hope and believe, never secure any strong support here, and the probabilities are that, through an independent press, through the wide influence of the Bullion Club, and the personal exertions of many gentlemen who are animated by a higher spirit of business morality than that which has had possession of mining in San Francisco, the public will be educated up to an appreciation of the necessary safeguards to apply to mine management, and will decline to invest in mines which do not furnish the necessary guarantees against dishonest management or ring manipulation.

The transactions in mining stocks for the week under review have greatly exceeded any previous week, being about 100,000 shares greater than last week. All classes of stocks have had a good representation, but the fancies have taken the lead.

The dealings in the San Francisco stocks have been as follows: Belcher, 10 shares, at $9¼@$8; Bodie, 65, at $6½@$6¼; California, 465, at $6¼@$5⅝; Consolidated Virginia, 1070, at $6¼@$5⅝; Eureka Consolidated, 40, at $26½@$22; Grand Prize, 275, at $4.50@$4.35; Independence, 740, at $1.50@$1.80; Leeds, 100, at 60c.; Bechtel, 100, at $1.50; Caledonia, 50, at $3¼; Consolidated Imperial, 740, at $1.85@$1.45; Hussey, 5800, at 24@17c.; Leviathan, 200, at 35@25c.; Overman, 10, at $30; Tip Top, 450, at 80@75c.; Tuscarora, 7100, at 10@14c.

There has been a very good business done in the stocks listed at the New York Stock Exchange. The transactions have been as follows: Homestake, 1323 shares at $34@$32; Ontario, 400, at $40½@40; Mariposa preferred, 300, at $2.50@$2.25; Quicksilver preferred, 850, at $36@$35; Quicksilver common, 300, at $12½, and Sutro Tunnel, 15,040, at $3¼@$4⅛.

In the better classes of stocks at the Mining Exchange, we note transactions as follows: Findley, 9200 shares at 61@58c. The reports from this mine are very encouraging, and indicate that dividends will be resumed from this month's product. Hukill has been very quiet, the sales amounting to 250 shares, at $3. Moose continues to hold a very high position for a mine that has done so little, and which does not promise much. The sales of this stock for the week have amounted to 11,425 shares at $4@$4.40. New York and Colorado has been liberally dealt in under a declining tendency. The sales amount to 1600 shares at $2.15@$2; Plumas

COAL STOCKS.

NAME OF COMPANY.	Capital Stock.	SHARES. No.	Par Val.	Last Dividend. Mo.	Y.	A't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted, so much per share. Mar. 15. H.	L.	Mar. 17. H.	L.	Mar. 18. H.	L.	Mar. 19. H.	L.	Mar. 20. H.	L.	Mar. 21. H.	L.	SALES.
	*		$				Per c'nt													
Consol. Coal.	10,250,000	102,500	100	Jan.	77	2½	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C.	2,000,000	200,000	100	Aug	76	4	9	40¾	40⅜	41	40¼	40	39½	40⅜	39½	40⅜	40⅜	39¾	39¾	3,155
D., L. & W. RR.	26,200,000	524,000	50	July	76	2½	5	47⅜	46½	47⅛	46⅞	47	45⅞	46⅜	45½	46⅜	46	46¼	45½	105,470
Lehigh C. & N.	10,414,560	208,971	50	Nov	76	1½	5½	15⅜	15⅜	.....	.....	15¼	15⅛	15	15	15	15	15⅛	14⅞	1,968
Leh. V'y R. R.	27,228,855	540,858	50	Mch	79	1	4	35⅜	35¼	35½	35⅜	35⅜	35¼	35¼	34⅜	34⅞	34⅝	34⅛	34¼	1,390
Maryl'd Coal	4,400,000	44,000	100	Jan.	76	1¼	1¼	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. C. R. R.	20,600,000	206,000	100	Apr	76	2½	2½	38¾	37⅝	39¼	38⅜	38⅜	37½	37⅝	36¾	37⅝	36¾	37¼	36½	54,220
Penn. Coal	5,000,000	100,000	50	May	78	3	.....	.....	.....	135	.....	.....	.....	.....	.....	.....	.....	.....	.....	24
Penn. R. R.	68,870,200	1,337,404	50	Nov	78	2	8	35	34¾	35	34⅞	34¾	34½	34¾	34½	34⅞	34⅝	34¾	34⅜	24,872
Ph. & R. R. R.	34,278,175	685,563	50	Jan	76	2½	10	12⅝	12⅜	12⅝	12⅜	12¾	12⅝	12⅝	12⅜	12¾	12½	12⅝	12½	4,676

The Delaware and Hudson Canal Co. has paid in dividends to date $38,821,104, and the Philadelphia and Reading $43,012,497
Total Sales..... 196,775.

GENERAL MINING STOCKS.

Dividend Paying Mines.

NAME AND LOCATION OF COMPANY.		Feet on Vein.	Capital Stock.	SHARES. No.	Par Val	ASSESSMENTS. Total levied to date.	Date and amount per share of last.		DIVIDENDS. Total paid to date.	Last Dividend.		Rate p. An	HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE. Mar. 15. H.	L.	Mar. 17. H.	L.	Mar. 18. H.	L.	Mar. 19. H.	L.	Mar. 20. H.	L.	Mar. 21. H.	L.	SALES.
Alps	Nev.	800		30,000		204,000	Aug. 1878	$1 00	37,500	Apr. 1876	$0 05														
Belcher, G. S.	Nev.	1,040	10,400,000	104,000	100	1,496,200	Feb. 1879	1 00	15,397,200	Apr. 1876	1 00				9¼	8									10
Bobtail, G	Col.	2,500	1,136,630	227,326	5	*			90,930	Nov. 1878	15														
Bobtail Tunnel, G	Col.		100,000	20,000	5	52,000	July 1873	0 30	36,000	Dec. 1879	40														
Bodie, G	Cal.		5,000,000	50,000	100	25,000	Feb. 1878	0 50	800,000	Jan. 1879	1 00		8⅛						8⅛	8¼			8¼		65
California, G. S.	Nev.	600	54,000,000	540,000	100				30,240,000	Jan. 1879	1 00		6¼	6			6⅛		6		6⅛	6	6	5¾	465
Calumet & Hecla, C	Mch		2,000,000	80,000	25	1,200,000			13,850,000	Feb. 1879	5 00		174		173½		173½	173			172				70
Central, C	Mch		500,000	20,000	25	100,000	June 1862	0 65	1,260,000	Feb. 1877	5 00														
Chollar Potosi, G. S.	Nev.	1,400	2,800,000	28,000	100	1,750,000	Sept. 1878	5 00	3,040,000	Feb. 1872	1 00														
Copper Falls, C	Mch		1,000,000	20,000	50	535,000	May. 1876		100,000	Nov. 1871	1 00				75c		75c		62½c	50c	50c				1,220
Cons. Virginia, G. S.	Nev.	710	54,000,000	540,000	100	474,600	June 1873	3 00	40,500,000	June 1878	1 00		6⅛		6¼		6¼		6½	6¼	6¼	5¼	6	5⅝	1,070
Confidence, G. S.	Nev.	130	2,496,000	24,960	100	256,320	Apr. 1878	0 50	78,000	May. 1865	8½														
Cons. Her. & Roe	Col.	16,500	1,000,000	100,000	10	*																			
Crown Point, G. S.	Nev.	600	10,000,000	100,000	100	1,973,370	Dec.. 1878	1 00	11,588,000	Jan.. 1875	2 00														
Daney	Nev.	2,000		108,000		91,800	Nov. 1878	0 20	56,000	July 1863															
Eureka Cons., G. S. L.	Nev.		5,000,000	50,000	100	100,000	May. 1876	1 00	3,600,000	Feb.. 1879	2 00				26½								22½	22	40
Eureka G. Mg., G	Cal.	1,680	2,000,000	20,000	100				2,149,000	Apr. 1878	0 25														
Findley, G	Geo.		200,000	200,000	1				40,000	Feb. 1879	10		59c	58c	61c	59c	62c	59c	59c		60c	59c	58c		9,200
Franklin, C	Mch		500,000	20,000	25	300,000	June 1878	5 00	585,000	Nov. 1871	1 00														
Gila	Ariz			100,000		70,000	Jan. 1879	0 25	50,000	Aug. 1875	0 25														
Gould &Curry, G. S.	Nev.	612	10,800,000	108,000	100	2,828,000	Nov. 1878	1 50	3,826,800	Oct. 1870	10 00														
Grand Prize	Nev.	1,500		100,000		100,000	July. 1878	1 00	400,000	Feb. 1878	1 00		4.50				4.50		4.50		4.50	4.35			275
Hale & Norcross, G. S.	Nev.	400	11,200,000	112,000	100	2,970,000	Dec. 1878	0 50	1,598,000	Apr. 1871	5 00														
Homestake, G	Dak		10,000,000	100,000	100				60,000	Feb.. 1879	30		33⅛	32¾	34	33¼	33⅛	32¾	33¼	32½	32⅝		32½	32	1,323
Hukill, G. S.	Col.	3,288	1,000,000	100,000	10	*				Dec. 1878	0 10										3				250
Independence	Nev.	1,500		100,000		75,000	Feb.. 1878	15	150,000	Nov. 1878	25		1.55	1.50	1.75		1.70	1.60	1.75		1.80		1.75	1.10	740
Kentuck, G. S.	Nev.	95	3,000,000	30,000	100	300,000	Aug. 1878	1 00	1,252,000	Mar. 1870	5 00														
K. K. Cons.	Nev.			50,000		300,000	Jan.. 1879	1 00	50,000	Sept. 1873	0 25														
Leeds	Uth.	3,000		60,000					78,000	Oct.. 1878	0 15						60c								100
Leopard, L. G. S.	Nev.	1,500	5,000,000	50,000	100	200,000	Jan.. 1879	50	162,500	Dec. 1876	0 50														
Manhattan	Nev.			50,000		50,000	Oct.. 1878	1 00	400,000	Feb. 1877	1 00														
Merrimac, S	Mas.	1,500	500,000	100,000	5	*	June		120,000	Mar.															
Minesota, C	Mch.		1,000,000	20,000	50	436,000		1 00	1,820,000	Mar. 1876	0 50														
Modoc	Cal.	4,000		100,000		450,000	Feb.. 1879	0 50	50,000	Dec. 1876	0 50														
Moose	Col.	39,000	2,000,000	200,000	10	*			550,600	Mar. 1878	0 25		4		4.10	4	4.35	4	4.40	4.25	4.40	4.15	4.40	4.15	11425
National, C	Mch.		500,000	20,000	25	195,000	Oct.. 1875	1 00	360,000	Oct. 1873	1 00														
N. Y. & Colorado, G	Col.		1,000,000	50,000	20	*			20,000	Mar. 1877	0 20		2.10		2.15	2.05	2.10	2.05			2.10		2		1,600
Northern Belle, S	Nev.	1,600	5,000,000	50,000	100				1,425,000	Feb. 1878	1 00														
Ontario	Uth.	3,000	10,000,000	100,000	100				2,050,000	Mar. 1879	50				40⅞		40½						40¾	40	400
Ophir, G. S.	Nev.	675	10,080,000	100,800	100	3,436,800	Nov. 1878	1 00	1,394,400	Mar. 1864	4 00														
Pewabic, C	Mch.		500,000	20,000	25	185,000	June 1868	3 00	460,000	July 1873	1 00														
Phœnix, C	Mch.		1,000,000	20,000	50	817,500	Sept. 1870	3 00	10,000	Dec. 1876	1 00														
Plumas	Cal.		1,000,000	100,000	10				130,000	Mar. 1879	10		3.45	3.35	3.40	3.30	3.40	3.35	3.35		3.35		3.35		1,900
Quincy, C	Mch.		200,000	20,000	10				2,230,000	Feb. 1878	5 00						10¼								140
Raymond & Ely, G. S.	Nev.	5,000	3,000,000	30,000	100	730,000	Jan.. 1879	1 00	3,075,000	Sept. 1873	3 00														
Ridge, C	Mch.		500,000	20,000	25	200,000			90,000	Feb. 1875	1 00														
Rye Patch	Nev.	1,600		30,000		157,500	Dec.. 1878	1 00	105,000	Dec. 1877	0 25														
St. Joseph, L	Mo.	2,000 acs.	1,000,000	100,000	10				250,000																
Savage, G. S.	Nev.	800	11,200,000	112,000	100	4,196,500	Feb. 1879	1 00	4,460,000	June 1869	3 00														
Seaton, G. S.	Col.	1,700	500,000	50,000	10	*				May 1877	0 10														
Sierra Nevada, G. S.	Nev.	3,650	10,000,000	100,000	100	2,350,000	Oct.. 1878	3 00	102,000	Jan. 1871	1 00														
Silver Islet	Mch												54		56	55¼	53	52	52	51¾	52				567
Silver King	Ariz	1,500	10,000,000	100,000	100				450,000	Nov. 1878	0 50														
Standard	Cal.			50,000		50,000	July 1878	1 00	900,000	Feb.. 1879	1 00														
Yellow Jacket, G. S.	Nev.	1,200	12,000,000	120,000	100	3,918,000	Jan.. 1879	1 00	2,184,000	Aug. 1871	2 50														
McClinton	Cal..	1,000		60,000		45,000	Dec.. 1878	0 25																	

Non-Dividend Mines.

Allouez, C	Mch.		1,000,000	20,000	50	840,000	May	1876	5 00																		
Alpha, G. S.	Nev.	306	3,000,000	30,000	100	240,000	Mar.	1878	1 00																		
Alta	Nev.	600		108,000		1,101,000	Feb.	1879	1 00																		
Am. Flag, G	Col.	5,300	600,000	60,000	10	*							22c		22c		22c		25c	22c			22c		6,700
Andes	Nev.	2,000		100,000		355,000	Oct	1878	0 25																		
Baltimore Cons.	Nev.	1,050		84,000		1,015,000	Apr.	1878	0 50																		
Benton	Nev.	600		108,000		91,800	Dec.	1878	0 50																		
Bechtel	Cal.			60,000		81,000	Feb..	1879	0 10								1.50								100
Bertha & Edith. G	Vir.	645 acs.	500,000	500,000	10	*							35c	27c	36c	33c	37c	33c	37c	26c	32c	28c	35c	29c	239,500
Best & Belcher, G. S.	Nev.	545	10,080,000	100,800	100	538,590	Jan..	1879	1 00																		
Boyle	Nev.	600		108,000		16,240	Aug.	1878	0 15																		
Buckeye	Col.		2,000,000	400,000	5	*							35c	33c	40c	35c	44c.	39c	42c	37c	43c	40c	51c	42c	113,000
Bullion, G. S.	Nev.	943⅛	10,000,000	100,000	100	3,002,000	Dec.	1878	1 00																		
Caledonia, G. S.	Nev.	2,188	10,000,000	100,000	100	1,590,000	Jan.	1879	0 50												3¼				50
Cashier	Col.		500,000	250,000	2	*																			
Challenge	Nev.	90		50,000		10,000	Nov.	1878	0 20																		
Cleveland, G	Col.	3,715	250,000	25,000	10	*																			
Cons. Imperial, G. S.	Nev.	468	50,000,000	500,000	100	875,000	Feb..	1879	0 20				1.80		1.80	1.70			1.60				1.45		740
Con. N. Slope & E. T. C.	Col.	15,000	500,000	10,000	50																				
Con. Pacific	Cal.	1,400		60,000																					
Dahlonega	Ga.		250,000	250,000	1								26c	24c	27c	25c	27c	26c	26c	24c	25c	24c	25c	23c	41,000
Dana, C	Mch.		500,000	20,000	25	68,000	Jan..	1863	0 50																
Dawson, S	Ont.		1,200,000	60,000	20			1878																	
Day	Nev.	1,500		100,000		70,000	Feb..	1879	0 15																
Dayton	Nev.	1,600		100,000		750,000	Apr.	1878	0 25																
De Frees	Ariz	1,500		100,000		115,000	Oct.	1878	15																
Duncan, S	Ont.		1,200,000	60,000	20	75,000	July	1876	41¾						5						4¾				250
Exchequer, G. S.	Nev.	400	10,000,000	100,000	100	480,000	Feb..	1879	1 00																
Gold Placer, G	Col.		5,000,000	200,000	25								32c	28c	35c	30c	39c	34c	35c	29c	32c	30c	33c	30	97,850
Granville, G	N. C.	357 acs.	1,000,000	100,000	10	*			0 50				18c	17c	20c	17c	24c	19c	26c	21c	23c	21c			22,100
Humboldt, C	Mch.		500,000	20,000	25	100,000	Sept	1878	0 15																
Hussey	Nev.	4,500		100,000		110,000	Jan..	1879	0 15				24c	20c	25c		21c	20c					18c	17c	5,800
International, S	Ont.		1,200,000	60,000	20												50c								
Julia, G. S.	Nev.	3,000	11,000,000	110,000	100	872,500	Jan.	1879	1 25																
Justice, G. S.	Nev.	2,100	10,500,000	105,000	100	2,763,500	Jan..	1879	1 00																
King's Mountain, G	N. C.		1,200,000	120,000	10	*																			
Kossuth	Nev.	2,700		108,000		421,200	Aug.	1877	0 15																
Lacrosse	Col.	3,900	1,000,000	100,000	10	*							33c	32c	33c	32c	33c	32c	31c		32c	30c	31c	30c	26,450
Leadville	Col.												2.85	2.65	2.80	2.75	2.80	2.70	2.80	2.60	2.75	2.60	2.75	2.65	8,250
Leviathan	Nev.	2,000		100,000		240,000	May.	1878	05				35c				25c								200
Luzerne	Col.	4,200	5,000,000	500,000	10	*																			
Madison, C	Mch.		500,000	20,000	25	123,000	Sept	1876	0 10																
Mariposa preferred	Cal.	44,387	5,000,000	50,000	100	1,425,000	June	1877	1 00				2.50	2.25											300
" common	Cal.	acres.	10,000,000	100,000	100	1,425,000	June	1878	1 00																
McCracken	Ariz	4,500		100,000		100,000	Oct	1878	0 50																
Martin White	Nev.			100,000		650,000	Dec.	1878	1 50																
Mesnard, C	Mch.		500,000	20,000	25	160,000	Apr.	1876	0 50																
Mexican, G. S.	Nev.	600	10,080,000	100,800	100	217,400	May.	1878	0 50																
Minnietta Belle	Cal.	1,500		100,000		75,000	Apr.	1878	0 50																
Mt. Bross Tunnel	Col.	8,600	2,000,000	200,000	10	*		1878																	
Navajo	Nev.	1,500		100,000		145,000	Feb..	1879	0 20																
New York	Nev.	1,000		100,000		800,000	Feb..	1879	0 40																
Occidental	Nev.	1,706		40,000		72,500	Feb.	1877	0 25																
Orig. Keystone	Nev.	1,500	1,000,000	100,000	10	50,000	Oct.	1878	0 50																
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	3,404,280	Jan..	1879	3 00												30				10
Osceola, C	Mch.		1,000,000	40,000	25	2,567,880	Nov.	1877	3 00																
Petherick, C	Mch.		500,000	20,000	100	165,533	Mar.	1876	0 50																
Pleasant View, G	Col.	1,200	200,000	20,000	10	*																			
Quicksilver preferred	Cal	8,500	4,291,300	42,913	100	*									36	35	36		35¼		35¼	35			850
" common	Cal.	acres.	5,708,700	57,087	100																12½		12½		300
Rockland, C	Mch		500,000	20,000	25	495,000	Jan.	1874	1 00																
Seg. Belcher, G. S.	Nev.	160	640,000	6,400	100	244,800	Apr.	1876	5 00																
Silver Hill, G. S.	Nev.	5,400	10,800,000	108,000	100	1,350,000	Jan.	1879	0 50																
Silver Prize	Nev.	1,500		100,000		65,000	Feb.	1879	0 25																
Star, C	Mch.		500,000	20,000	25	265,000	Mar.	1876	0 50																
Superior, C	Mch.		500,000	20,000	25	340,000	Mar.	1878	0 25																
Sutro Tunnel	Nev.		20,000,000	2,000,000	10				0 50																
Tiptop	Ariz			100,000									3¾	3¼	4⅞	4	4⅝	4¼	4½	4¼	4⅜	4¼	4⅜	3⅞	15,040
Tioga	Cal.	1,500		100,000		120,000	July	1878					80c				80c	75c			S0c	75c			450
Trio	Col.	1,250	150,000	150,000	1	60,000	Dec.	1878	0 20																
Trojan	Nev.	1,500		100,000		240,000	Oct.	1878	0 25												55c		60c	55c	1,000
Tuscarora	Nev.			100,000		20,000	Nov.	1878	0 05																
Union Cons. G. S.	Nev.		10,000,000	100,000	100	310,000	Apr.	1878	0 25				13c	10c	14c	12c	14c	13c	14c	11c	14c	13c	14c	13c	7,100
Utah	Nev.	1,000		20,000		780,000	Feb.	1879	3 00																
Ward	Nev	1,200		110,000		99,000	Jan.	1879	0 30																
Wells Fargo	Nev.	1,500		108,000		216,000	Sept.	1878	0 50																

G. Gold. S. Silver. L. Lead. C Copper. * Non-Assessable. +4 15 16

Total Assessment levied to date..... ....$64,647,813

Total Dividends paid to date..... ....$153,704,330

Total Sales for the week.....617,050.

has been rather regular and only moderately active, at $3.45@$3.30, the sales amounting to 1900 shares. Leadville is receiving a great deal of attention, and is likely to be highly speculative. The sales amount to 8250 shares, at $2.85@$2.60. Trio has been very quiet, especially for a stock selling at so low a price. The sales only aggregate 1050 shares at 60@55c.

The fancies have been unusually active, and, although not so high as earlier in the week, yet fairly firm. Bertha & Edith has continued the leading card, its dozen of veins and its $100 ore being the talk of every one. Until some developments are made, too much importance should not be given to the statements of the company, and the public should not be paying from $150,000 to $175,000 for the property when there are dozens of properties in the South that are claimed to have at least as good prospects that can be bought for one twentieth of the amount. The sales of this stock for the week have amounted to 239,500 shares, at 27@37c. American Flag records 6700 shares, at 22@25c., and all this without any regard to whether there is a title or not, and with the fact that it would be of but little if any value if there was one. Buckeye has improved greatly, owing to its having satisfied the Exchange that it has title to most of the King of the Valley mine. The sales have amounted to 113,000 shares, at 33@51c. Dahlonega records sales of 41,000 shares, at 27@23c. Gold Placer has ranged between 28@39c., with sales of 97,850 shares. Granville has taken its position in the ranks, and has made a good score, the sales amounting to 22,100 shares, at 17@26c. Lacrosse has lost the position it once held, and in so active a market as we have had this week there has been a business of but 26,450 shares, at 33@30c.

The following is from official letters from some of the leading Black Hills mines: "The Deadwood mill is running very well. The machinery for the Golden Terra mill is on the ground. The Homestake's new 120-stamp mill is under cover, and the machinery is arriving rapidly. In the Malory cut of this mine the vein is 200 ft. wide, and the face is in very fine ore. The Golden Star cut is 40 ft. wide, and the ore high grade. The 100-ft. level shows very good ore. The production for February was $55,000."

There have been received in this city this week 2 bars of Homestake bullion valued at $39,000; 1 bar from Golden Terra, valued at $11,000; and 1 bar from the Giant and Old Abe, valued at $5200.

The Empire Gold Mining Company has declared dividend No. 7 of 8c. per share, payable March 31st. Transfer-books will close March 25th and open April 1st.

The Leadville Mining Company has declared its first dividend of one per cent, payable April 1st.

A letter, dated March 14th, from the President of the Leadville Mining Company, says that the company is shipping about 20 tons of ore daily, and that the ore in the lowest parts of the mine is showing well.

A telegram from the Piumas mine, dated March 20th, says: "We have been snowed in two weeks; no communication. Mine is looking well. Shaft ore is very rich."

The Leadville Mining Co.—The decision given by Judge Hallett in the case of New Discovery *vs.* Little Chief, at Leadville, Colo., was, as our readers will remember, that a mine could follow its vein in depth outside of the surface lines, only when both the foot and hanging walls were rock in place. All ore found otherwise was considered only float, which can not be followed outside the limits of the claim surface lines downward. In the recent case of the Little Giant *vs.* the Leadville Mining Company, the experts of the Little Giant testified that the rock found in the Little Giant shaft was not rock in place, hence, according to the previous ruling, this company can not follow the ore outside of its surface lines, and can not, therefore claim any of the ore under its neighbors' claims. The Court gave the Leadville Mining Company leave to file a new bill, and ordered that the witnesses and experts of the Leadville Mining Company be allowed to examine the shaft and workings of the Little Giant. We may therefore expect new evidence, and a practical reopening of the case. The question as to what is rock in place and what is float or drift seems now the important one in Leadville, and until that is settled none of the decisions recently given appears to have much weight.

REVIEW OF THE SAN FRANCISCO MARKET.

The San Francisco market is an anomalous one. A decided decline has taken place in the whole list, and this in the face of an agreement which has been made between the Sutro Tunnel Co. and the mine owners. With reference to this, it is stated that 3000 men are to be put immediately to work opening and extending levels from the tunnel to the different mines, the expense of which is to e borne by the mine owners, and by them to be deducted from the royalties due to the tunnel company. In this connection, are revived the rumors of the consolidation scheme whereby all of the principal mines of the Comstock are to be placed under one directory, the plan to contemplate two classes of securities, representing nearly the whole Comstock interests—a bond and a common stock—the former to be a guaranteed 10 per cent investment. The above position of Comstock affairs may afford sufficient explanation, taking other precedents for a guide, of the present depression, and should the above rumors, which are becoming common property, have any foundation, the decline may be forced that such arrangements can be effected at the least cost to those pulling the inside wires. A dispatch dated March 20th, from Virginia City, Nev., says the Norcross and Savage mines have closed until the Sutro Tunnel drains are completed.

Alpha opens to-day at a decline of $1 per share. It is given out that Senator Sharon is reaching for the control of this mine.

In the Alta mine favorable progress is being made, The joint Alta-Benton winze is rapidly approaching the 1600 level. This stock shows a slight improvement.

Belcher has declined to $7¾ against $9⅝ as in our last. The vein in the drift on the 2360 level of this mine is reported as being 130 feet in width, carrying beautiful quartz, with some mineral.

Best & Belcher opens at $17½, a decline of $2 per share. The Osbiston is now down over 500 feet.

Bodie shows some improvement, and the outlook for the mines in the district is encouraging. The Bodie mine is now shipping to the Syndicate mill from 45 to 50 tons of ore per day. It is stated that this company has now in its treasury a reserve of $200,000, equal to $4 per share. The Bodie tunnel is now in 825 feet, and the progress of the same is looked to with considerable interest. Bulwer shows some advance on the San Francisco market, late sales being made at $18 per share. The ore stopes in the mine continue to look well, and are yielding their usual quantity of rich ore.

Telegraphic information received in this city relative to the mines of the Bodie District, has been as follows: Bechtel has struck two feet of ore on its 700 level, assaying $80@$200 per ton. The stock advanced in San Francisco from 60c. to $2.40 per share. South Bodie, at a depth of about 340 feet, struck a ledge 4 feet wide, with a 10-inch pay streak assaying $95 per ton in gold and $10 in silver. The price of the stock advanced from 25c. to $1 per share. The Harrington tunnel, east of Standard, struck a rich vein at about 380 feet, and, at last advices, had not cut through it. This property, like the Standard, is in the heart of the district, and consists of a consolidation of several properties. Four parallel ledges are opened. The mine is not as yet listed, and is operated in the interests of both Eastern and San Francisco owners.

The very rapid development of this district indicates the importance it will take as a producer of gold. The strike in the Bechtel is said to prove increased wealth in the Standard mine.

Our exchanges and letters speak very encouragingly of the prospects of the Standard mine. The most energetic measures are being taken for the proper working of this property, and there is no lessening of the ore reserves; indeed, new developments are reported as showing additional resources. The new shaft is down over 800 feet, and it is anticipated that it can be sunk to the depth of 1000 feet without the use of a pump. The company is shipping at the rate of $100,000 per month. The Black Hawk mine has cut a five-foot vein of good milling ore in the "Warren lode." The new shaft of this mine is down about 325 feet. Recent sales of this stock have been made on the San Francisco market, at from 65c. to $1.05 per share.

Bullion has declined with the rest. Nothing particularly interesting from the mine.

The old bonanzas, California and Consolidated Virginia, barely hold their own. The February product of the former company was about $160,000, and the present output is 240 tons per day of low-grade ore. The latter company is increasing its product, and is now mining over 250 tons of ore per day.

Caledonia and Chollar-Potosi are lower, with nothing of special interest from the mines.

Exchequer opens at $4¼, a decline of $1. It is stated that the vein in the north drift on the 2400 level of this mine is widening as progress is being made.

Eureka Consolidated stock is selling on the basis of $1,100,000 for the whole property, equal to a decline of $4 per share for the week. We have no information which explains the reason for the course of this stock. This company is apparently in a position to annually return to its stockholders, in dividends, more than the present market value of the stock. The Pacific Coast press, official and non-official letters regarding this mine speak in the most encouraging terms regarding its value and future prospects. The stock of the Hamburg mine in this district is selling in San Francisco at from 50c. to 60c. per share. The Richmond, Jackson, Albion, and indeed all the mines of this district, are looking well.

Gould & Curry is lower. Water is troubling this company very much.

Grand Prize closed yesterday at $4¼, against $4⅝ a week ago. Ore from this mine is being wholly taken from the upper stopes.

Ophir and Mexican share in the general decline, each being about $5 lower than in our last; the yield of the former mine is now approaching that of the California company, the February product amounting to $165,000.

The new bonanzas are exceptionally lower, Union Consolidated showing a decline of $10 per share, and Sierra Nevada $2.

ASSESSMENTS, with dates when delinquent: Leviathan, 25c., April 12th; Pioneer Con., 5c., April 12th; Queen Bee, 10c., April 9th; Con. Dorado, 50c., April 12th; Gould & Curry, $1, April 16th; Leopard, 50c., April 14th; Phoebe, 25c., ; Richer, 25c., April 14th; De Frees, 10c., April 14th; Orient, 10c., April 10th; Yuba Gravel, 25c., April 9th; Wide Awake, 4c.

The Monarch Gravel Mining Co. has declared a dividend of $1.50 per share.

The Clear Creek Reduction Co. of Colo. has declared its ninth regular monthly dividend of one per cent on the capital stock.

ANNUAL MEETINGS:

Fourth of July Con. Mining Co., March 25th.
Hoosac Con. Gold and Silver Mining Co., March 25th.

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS Mar'h 14.	Mar'h 15.	Mar'h 17.	Mar'h 18.	Mar'h 19.	Mar'h 20.	Opening. Mar'h 21.
Alpha	21	21	20¾	21	21¾	19¾	19
Alta	5¼	5⅞	5⅝	6½	6¼	5¼	5⅞
Argenta							
Bechtel							
Belcher	9	9⅛	9	9⅛	8⅝	8⅛	7¾
Belle Isle							
Benton							
Best & Bel.	20	20¼	21	19⅝	19	18	17½
BlackHawk							
Bodie	6	6	6¼	6½	6½	6½	
Booker							
Bullion	6⅜	6¼	6	6⅛	5⅞	5¾	5¼
Bulwer							
Caledonia	3½	3¼	3¼	3⅛	2¾	2½	2½
California	5⅝	5¾	5¾	6	5¾	5¾	5½
Chollar-Pot	50	50	51	47½	47	44	41½
Confidence							
Con. Imp							1.25
Con.Va	6	5¾	6	6	5⅞	5⅝	5⅝
Crown Pint	6½	6⅝	6⅜	6½	6⅛	5⅝	5
Endowm't							
Eureka Con	26½	26¼	27	25¾	24	22	
Exchequer	5⅞	5⅝	5⅝	5⅝	5⅛	5	4½
Goodshaw							
Gould &Cur	10⅝	11⅝	12¼	11½	10⅝	10	9¼
Grand Prize	4½	4½	4½	4½	4¼	4¼	
Hale & Nor.	17¾	18	18¼	18½	16¾	15	14
Hamburg							
Homestake							
Hussey							
Indep'd'nce							
Jackson							
Julia Con	5⅜	5½	5⅜	5¾	5½	5	4¾
Justice	4⅝	4⅝	4¼	4⅜	4¼	4¼	4
Kentuck						5¼	5
Kossuth							
Leopard							
Leviathan							
Manhattan							
McClinton							
MeadowVal							
Mexican	40	40¾	40¾	40½	38½	37	36
Mono							
Navajo							
North. Belle	11	11	11	11¼	11	10½	
Ophir	36	36	35½	35½	34	32	31½
Orig. K'ys'e							
Overman	13⅝	13⅞	14	13⅝	12⅞	11¾	10½
P. Sheridan							
Ray. & Ely	6¼	6½	6½	6¼	6½	6⅛	
Richer							
Savage	14¾	14¾	15⅝	14⅝	13⅞	12¾	13¾
Scorpion							
Seg.Belcher							30
Sierra Nev.	49	48	47¾	48	46	44½	46
Silver Hill						2	2
Silver King							
Summit							
Tioga							
Tip Top							
Union Con.	17	15	14	15	10	07	06
Utah						17¾	18
Ward							
WashoeCon							
Wells Fargo							
Yel. Jacket	20⅝	20¼	18⅝	18⅝	17½	16¾	16½

The Bank of Nevada.—We give below a statement of the assets and liabilities of this institution on the 1st inst., compiled from the report of the Bank Commissioners and to the Attorney General of California:

ASSETS.

Banking house and lot	$100,000.00
Other real estate owned	824,622.19
Loans on real estate	1,039,664.02
Invested in stocks and bonds	4,529,80[illegible].00
Loans on stocks and bonds	3,360,066.18
Loans on personal security	1,274,510.36
Loans on other securities	897,298.42
Money on hand	3,336,479.40
Deposits in other banks	4,136,477.22
Office furniture, fixtures, and safes	3,867.00
Expenses, taxes, etc	19,505.07
Silver and trades	605,203.56
Other assets	25,507.67
Total	$21,353,091.09

LIABILITIES.

Capital paid in coin	$10,000,000.00
Reserve fund	3,500,000.00
Due depositors	6,883,264.42
Due banks and bankers	498,605.36
Interest account	142,778.67
Profit and loss account	178,472.33
Undivided profits	149,970.31
Total	$21,353,091.09

Mining Dividends Paid During 1878.—The San Francisco *Stock Report* of the 14th inst. publishes the following list of dividends paid by incorporated companies on that coast during the year 1878:

Black Bear Quartz, Siskiyou County	$30,000
Bodie, Mono County	750,000
California, Storey County	8,100,000
Consolidated Virginia, Storey County	5,400,000
Centennial, Nevada County	1,500
Consolidated Amador, Amador County	40,000
Empire, Nevada County	15,000
Eureka, Nevada County	5,000
Excelsior Gravel, Yuba County	81,000
Eureka Consolidated, Eureka County	1,800,000
Georgia, Storey County	2,500
Grand Prize, Elko County	200,000
Golden Star, Arizona	25,000
Idaho, Nevada County	263,500
Independence, Elko County	150,000
Indian Queen, Esmeralda County	30,000
La Grande, Stanislaus County	12,500
Leeds, Utah	27,000
McMillan, Arizona	15,000
Napa Con. Quicksilver, Napa County	10,000
New York Hill, Nevada County	10,000
Ontario, Utah	1,05[illegible],000
Redington Quicksilver, California	151,200
Silver King, Arizona	350,000
Standard, Mono County	600,000
Total	$19,119,700

The Mode of Transporting Bullion in China.—The transmission of Chinese treasure is thus described in the Foochow (China) *Herald*: "Bullion is conveyed to Peking in 'sheaths,' which are nothing more than rounded logs about three feet in length and circumference. Each log contains 3000 Tis, or $5000, and is split into two parts, which are then hollowed out for the silver. Of course these halves fit most accurately together, and can not possibly be tampered with. The chink is pasted around with a fine strong paper, and this is carefully stamped. The logs are then bound with iron clamps, and are ready for the roughest usage."

The Coinage of Silver Dollars.—WASHINGTON, March 15.—The following is a statement relating to standard silver dollars made from latest returns: Amount in Treasury, $20,210,105; amount in circulation, $6,822,595; average daily issue since January 1st, 1879, $19,000; average daily coinage, about $75 000.

Exports of Gold and Silver from New York.

Week ending March 15th	$376,560
Corresponding week last year	249,611
Since January 1st, this year	3,785,462
Corresponding period last year	2,435,825

The Union Pacific earned a little more in 1878 than in 1877, and at a little less expense, permitting an increase in net earnings of about $350,000, or 4·7 per cent. There was a very large decrease (one sixth) in through passenger traffic, but an increase of 9 per cent in the local passenger traffic—the aggregate decrease of 10¾ per cent, the local travel on this road being as yet only two fifths of the through. The freight increased, both through and local, in the aggregate, 9·9 per cent. The average freight rate was a trifle higher than the previous year. The renewals of rails (which were criticised in the last report of the government directors as having been insufficient heretofore) were at the rate of 10½ tons per mile of track in 1878, which is about 12 per cent of the whole, and an unusually large proportion to lay in one year in these days. More than two thirds of these renewals were with steel; the rest with re-rolled iron. The report says that 15,000 tons of steel are to be laid this year, which will renew nearly one sixth of the whole track. The tie renewals last year amounted to about one seventh the whole number, which in the dry climate of the plains ought to be much more than the average required for maintenance.

The report says that the application of the Thurman bill (the validity of which it contests) to last year's business would have left of the net earnings an amount equivalent to 7½ per cent on the stock.—*Railroad Gazette.*

Traffic prospects, so far as bulk of business is concerned, seem to be unusually favorable. News from almost all quarters in the country indicates greater activity in business and manufactures, and in the latter there seems to be fuller employment for the works than before for six years. Meanwhile the area under cultivation in the West will probably be extended this year more than ever before in any one year. The rush of immigration is very great, especially to Kansas; a great many are going to Texas and Nebraska, and Western and Southwestern Minnesota are also receiving large accessions, while a very considerable traffic is given to several Western roads by a large immigration to the new, rich mining district of Colorado and the freight that attends it. There was an exceptionally theavy immigration last year, and these settlers will but fairly begin to produce this year. They make a large demand in the Northwest for the supply and transportation of lumber and other building material and agricultural implements, and if the crops turn out as well this year as last (which is more than it is reasonable to expect, perhaps, and certainly more than it is wise to count upon), there will be greater traffic for many of the Western roads than they have ever known before.

To the other favorable symptoms may be added this, which is, perhaps, as significant as any of them, that the shipments of freight westward from New York by the trunk lines have been about 10 per cent greater so far in 1879 than for the same time in 1878—10 per cent greater in January and February, and 9 per cent greater in March. New York supplies the whole country with merchandise, and the amount of its sales is likely to reflect quite closely the average prosperity of the country. It is different with east-bound freights. There may be a great increase in the amount, when at the same time the prices are so much lower that the producers are not able to purchase so much as when they had less to sell; and the chief freights eastward are from a single class of the population, the farmers, while those westward are consumed by all classes of the population. So large an increase for so long a time is a significant fact. We note also that the lumber shipments from Chicago this year have been nearly 50 per cent greater than last year. There seems good reason to believe that the tide whose downward course was checked last year is now moving upward.—*Railroad Gazette.*

Copper Stocks.

Reported by WILSON W. FAY & Co., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveller Building, 31 State street.

BOSTON, Thursday Evening, March 20, 1879.

The market has fallen off to some extent, owing probably to the decline in the general market and another tightening in money, which advanced to 6 per cent between banks. There has been a medium amount of activity, however, and the decline was not so great as to alarm many of the holders, who predict a reaction as soon as money becomes more easy. Calumet & Hecla has declined from 174 to 172, and closes steady at 172@172½.

Copper Falls has fallen rapidly to 45c. within a few days, and is going to be assessed. Mr. Brooks, the new Treasurer, informs us that after the assessment they are going to use every possible effort to work the mine so as to make it pay the stockholders. The stock closes weak, at 40@45c.

Franklin is stronger, at 4@4¾, and no sales.

Osceola is a trifle weak, at 10¾@11⅛, and sales at 11⅛.

Pewabic is quiet, at ¾@1.00.

Quincy is also weak, having sold down to 10¾, and closing 10¾@11.

Ridge is steady at ⅞@1.00, and sales at 1.00.

Duncan is firm, although having declined from 5 to 4¾, and closes 4⅝@4¾.

International has also declined from 60c. to 40c. bid and 50c. asked, and sales at 50c.

Silver Islet has been quite active, fluctuating between 51¾@56, and closing steady at 51¾@52c.

Sullivan silver is weak, having sold down to 9¾, and now offered at that figure with few bidders.

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Buy and sell mining stocks on commission on New York Mining Stock Exchange, and offer superior facilities on San Francisco Exchanges through agency of the Bank of California.

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Mining & Milling Company
OF
GLOBE DISTRICT PINAL CO., ARIZONA.

Incorporated under the General Laws of the State of Illinois, December 30th, 1878.

JOHN HISE.....President
OTTO WASMANSDORFF.....Secretary

This Company is now building the machinery for the extensive reduction-works, to be erected on its property, comprising 20 of the richest mines in the Globe District. There are now large amounts of Ore waiting for the completion of the mine, securing immediate returns to the stockholders.
A limited number of shares, par value $100, is now for sale at $25 each, full paid up and non-assessable, by
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DIVIDENDS.

OFFICE LEADVILLE MINING COMPANY,
NO. 57 BROADWAY.
NEW YORK, March 15, 1879.
DIVIDEND NO. 1.
The Board of Trustees have this day declared a dividend of ONE PER CENT on the capital stock of this company ($2,000,000), out of net earnings, payable at the office of the company on and after April 1st, 1879. Transfer-books will close on the 25th and reopen April 3d.
J. S. LOCKWOOD, Secretary.

OFFICE OF THE EMPIRE GOLD MINING CO., No. 8 Wall street.
NEW YORK, March 18, 1879.
DIVIDEND NO. 7.
The directors of the above company have this day declared the regular monthly dividend of EIGHT cents per share (par value $10), for the month of February, payable at the office of the company, by the Treasurer, S. V. White, on the 31st inst., the books to close March 25th and re-open April 1st, 1879. G. H. HANDFORTH, Secretary.

Patent Mineral Wool.
ENTIRELY FIRE-PROOF AND UNDECAYING.
THE BEST INSULATOR OF HEAT, COLD AND SOUND,
For lining Roofs, Walls, Ice-houses, Refrigerators, Furnaces, Heater-Pipes, Boilers, etc.
ALEXANDER D. ELBERS.
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Trade Mark, Jan. 21, 1872.
Priority, Aug. 28, 1872.
Patented March 17, 1874.
Patented Dec. 12, 1872.
Patented Oct. 8, 1873.
Patented Dec. 24, 1872.
Patented Sept. 30, 1873.
FOR
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Safe, Reliable and Economical.
MANUFACTURED BY THE
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ST. CLAIR, SCHUYLKILL COUNTY, PA.

NOTICE TO MACHINISTS AND OTHERS.
CITY ENGINEER'S OFFICE,
RICHMOND, VA., February 28, 1879.
Proposals are invited until July 1st, 1879, for furnishing the BEST DESIGNS of NEW PUMPING-MACHINERY for the Richmond (Va.) Water-Works, for which premiums will be paid as follows:
First best design, $500.
Second best design, $300.
Third best design, $200.
The Committee of the City Council reserves the right to reject any and all designs.
For particulars, address the undersigned.
W. E. CUTSHAW,
City Engineer.

ICE at $1.00 per Ton!
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ROPE AND BLOCKS,
ANY KIND, ANY SIZE, BEST QUALITY.
TENTS, CHAIN, ANCHORS, OAKUM, ETC.
GILBERT HUBBARD & CO, CHICAGO.
SEND FOR CIRCULARS.

LEFFEL WATER WHEELS,
With recent improvements.
Prices Greatly Reduced.
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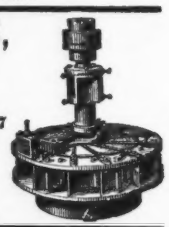

CALLON, J.—Lectures on Mining, delivered at the School of Mines, Paris. By J. Callon, Inspector-General of Mines. Translated at the Author's Request by C. Le Neve Foster, D.Sc., and W. Galloway, H. M. Inspector of Mines. In Three Volumes. London and Paris: 1876. Vol. I., 8vo, cloth, pages 459; and Vol. I., Atlas of Plates, 4to, half bound, 40 plates. The two volumes, $9.25.
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MINE LOCATED IN THE GREAT MINERAL BELT NEAR DEADWOOD.
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CAPITAL STOCK, $1,000,000. PAR VALUE OF SHARES, $5.
FOREVER UNASSESSABLE.

R. P. CORMACK.....President
R. McNAUGHT.....Secretary and Treasurer
D. B. CANOL..Vice-President and General Manager, Deadwood, D. T.

This mine is situated in the heart of the Black Hills, and on the acknowledged richest gold belt on this continent, if not in the world.
The improvements on the mine consist of a shaft 36 feet deep, from which a drift has been run 21 feet, all in paying ore. On a level with the orifice of the shaft a drift has been driven 42 feet, with a northeasterly cross-cut 28 feet 7 inches, from where a back stope was run up to the grass roots, giving a breast of 31 feet 10 inches, and 37 feet wide. Eighty-five feet below the adit a tunnel has been commenced and run 66 feet, and will strike the ore-body at present disclosed at the bottom of the shaft 22 feet lower.
From this work 250 tons of ore have been milled as a test, the lowest being $8.40, and highest $25.60. The work thus accomplished shows at the lowest estimate 10,000 tons of ore in sight.
The Directors have set aside 50,000 shares of stock for the purchase of machinery, 20,000 of which are offered for sale at $1 per share until further notice.
We respectfully invite the closest scrutiny and most searching investigation into the merits of this property.
R. P. CORMACK, President. **R. McNAUGHT, Secretary,**
Office, 61 Broadway, Room 38, New York.

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OF COLORADO,

To be organized under the laws of the State of New York, with a capital of $500,000, divided into 100,000 shares of $5 each, full paid and unassessable. 50,000 shares of said capital will be set aside to provide funds for the further development of the property, of which 40,000 shares are now offered to subscribers at $1.25 per share.

On a Basis of $125,000 for the Property, with $50,000 Cash and 10,000 Shares in the Treasury.

There are 3000 feet on the Leavite, Kip, and Vasa lodes, all covered by United States Patents.
The improvements on the property consist of a 60-stamp mill complete, with an 80 horse-power engine for driving the same; also a 70 horse-power engine for hoisting and pumping, all in first-class condition, and inclosed in substantial stone buildings. The "Buell Mine" has produced nearly a million dollars in bullion, and is well known as one of the best gold mines in the State.
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